

# friendly light

Palino



IT'S AWESOME

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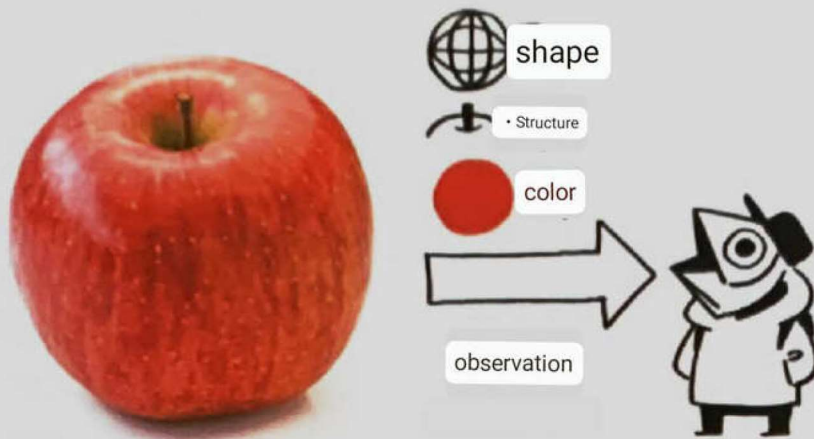
PART 00

# INTRO





## 1\_Observation, Interpretation, Reproduction



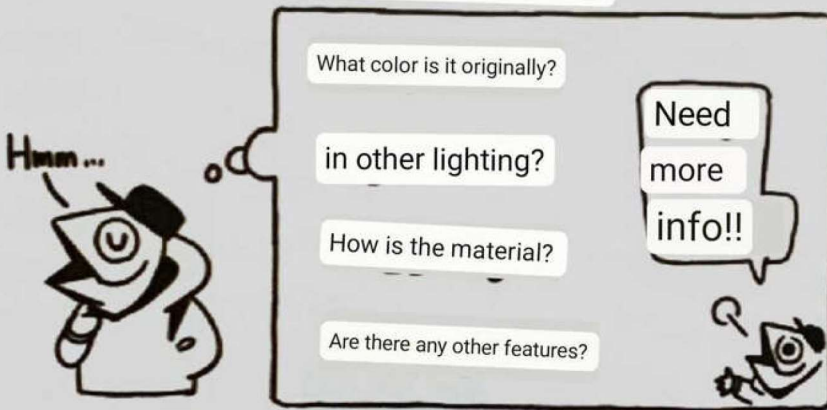
We acquire visual information through observation. Everything

visible to the eye, such as the shape, structure, color, and material of

an object, becomes visual information. The

more you repeat your observations, the more information you get.

## interpretation



Information obtained from the subject is interpreted in the head.

Information is simplified as soon as it is remembered, and the

simplified information is encoded and stored. (Ex. Apples are red.)

The more visual information you have, the more detailed you can

remember.

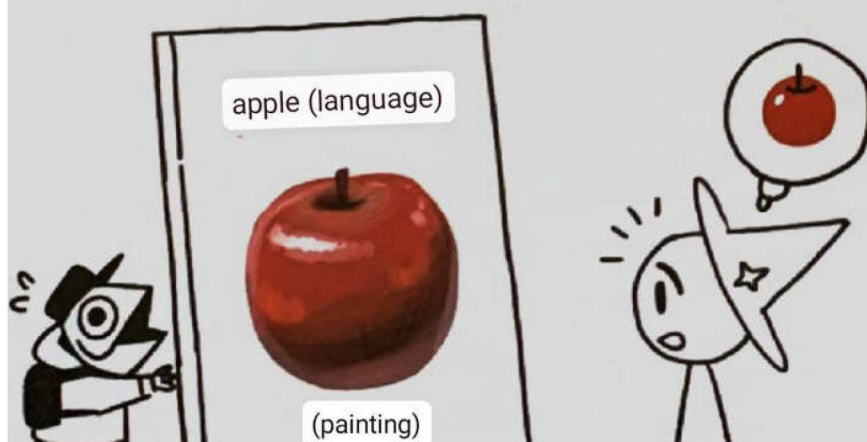


Visually reproduce visual information. There are

various methods of reproduction, such as drawing and modeling.

Reproduction requires sufficient preparations including information, and

the subjectivity of the creator is sometimes added.



What is completed through this is called a painting, and

the painting conveys information to other observers. A picture with

accurate information well reproduced becomes a

more powerful means of communication than language.

## 2\_ Symbolizing light and color



Do I look red?



Aren't apples red?



half right..

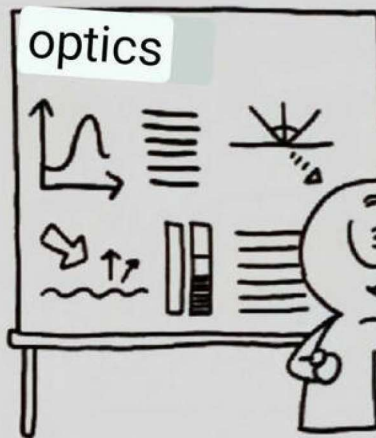
I paint it 'dark red'



Unlike form, structure, and shape, color is a subjective sensation felt by the observer, so it often creates optical illusions.

For example, the information that an apple is red is very subjective and

fragmentary. However, in practice, apples rarely have a pure red color, and the red color of apples is only used as a kind of symbolic information.



Five?

You want to know the light?

I'll just leave



The basics  
are 'I have to do it...'

[To use color, you  
need to know the light~

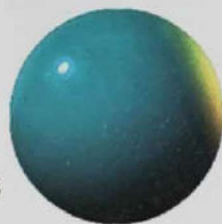


In order to create realistic colors, it is necessary to understand the light that makes the colors appear.

Since light is a physical concept, it is difficult to observe intuitively, but the principle of light making color is very important knowledge.



"According to this principle,  
these colors appear."



"Hehe~ It's okay, sharing

<Gunyang is just a bit of a mess ❤️



... light is grammar,  
color is language!!!

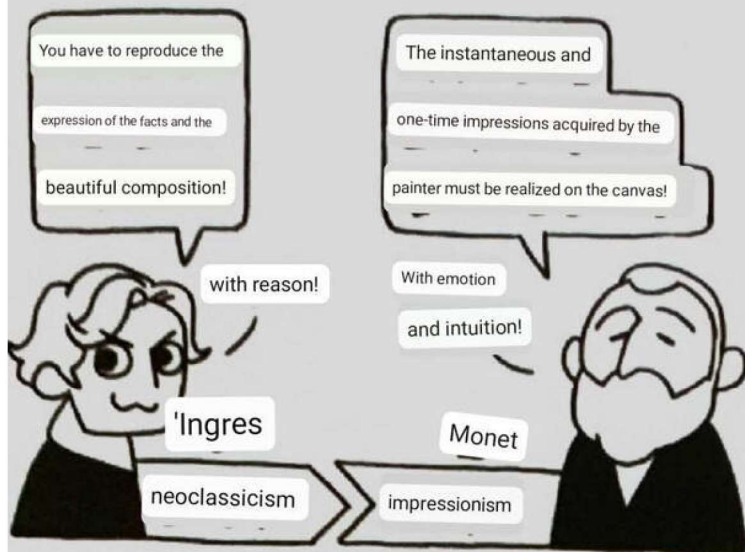


However, since color acts as a language for communication, it can be attractive enough even if it is not an objective and accurate

color. Therefore, based on accurate color by light, beautiful colors can be expressed when the creator's subjective coloring is combined.



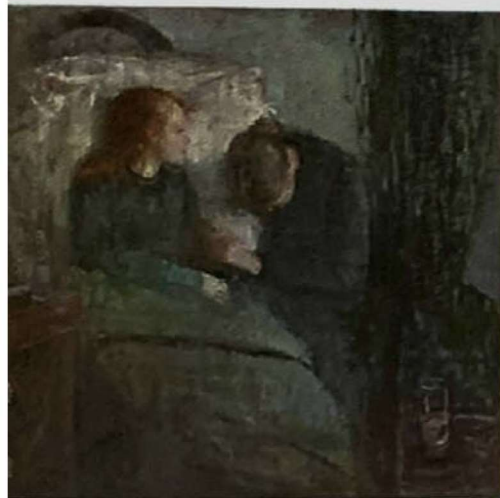
### 3\_ Artists who studied light and color



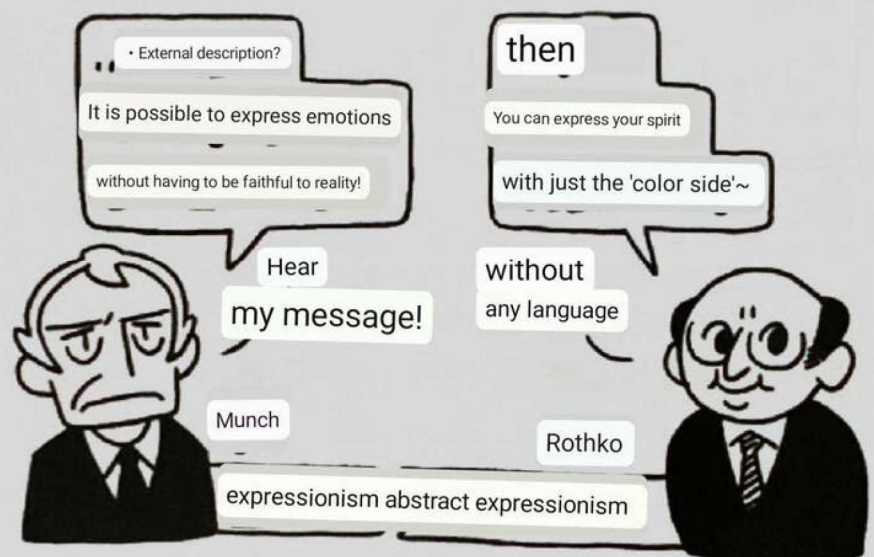
-Claude Monet (Impression, Sunrise), 1872, oil painting

The philosophies and ways in which painters deal with color have changed and diversified over a very long time.

Classical painters tried to express the ideas of Enlightenment at the time pictorially, and they portrayed the expression of vitality and realism in a dramatic way. On the other hand, Impressionist painters expressed their intuitive impressions, which became the roots of modern art through subjectivity and relativity.



Edvard Munch, The Sick Girl, 1886. Oil painting

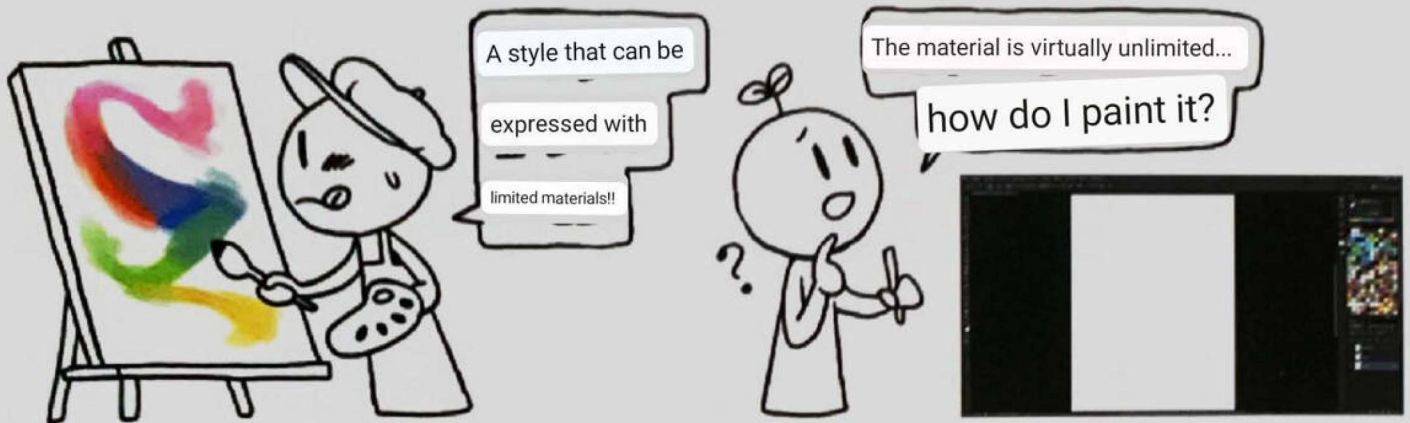


With the arrival of great art, the subject of expression became more diverse, and color as the purpose of reinterpretation remained as one option. Through Expressionism, which tried to express excitement with intense colors and despair with gloomy colors, the subjectivity of color was further emphasized. It is recommended that you think of light and color as one material in coloring, and think about what and how to color.

It's not all about coloring well.

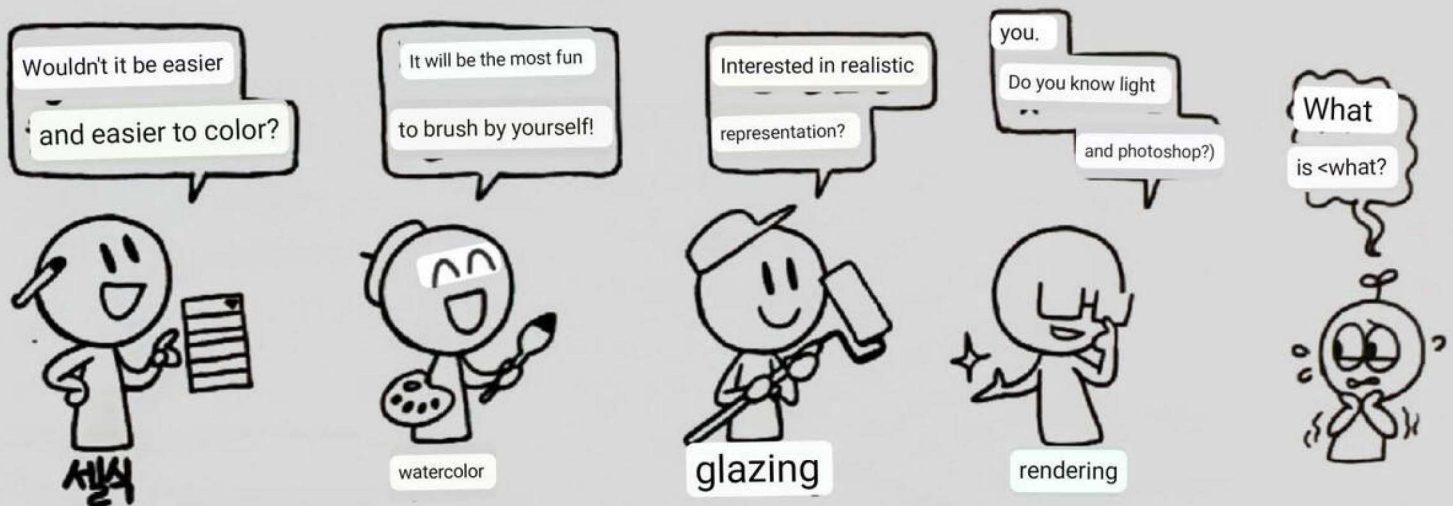


## 4\_What kind of color should I use?



Compared to painting, the digital coloring method is very free in choosing and mixing colors. The

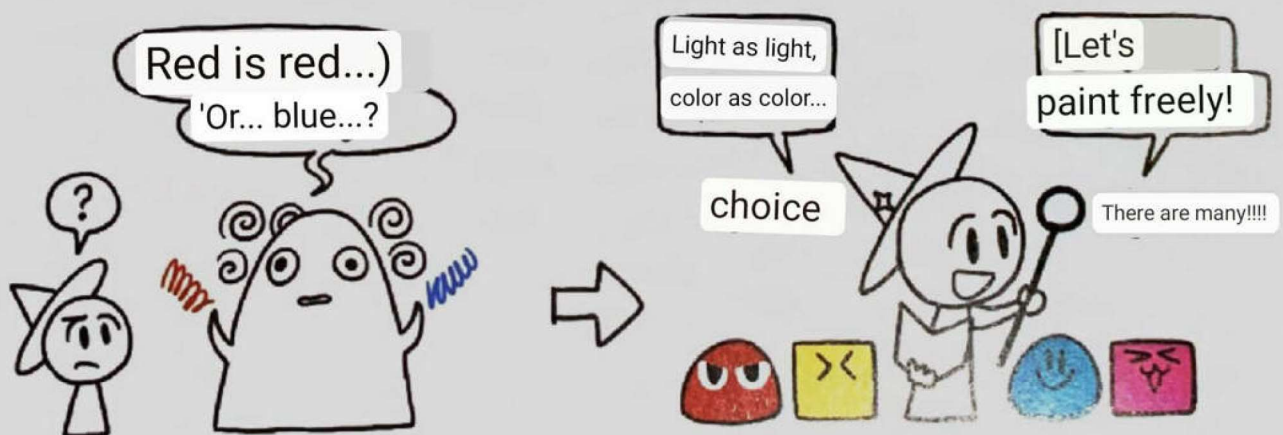
coloring methods and styles are so diverse that it is impossible to distinguish them. Which coloring method should we use?



Aside from the way you color, you need to think about what and how you want to express it. How

the picture will appear, such as simple and bright feeling, realistic and deep expression, is determined by subjective preference.

Each coloring method has a favorable atmosphere to express, but it is also impossible to define it as a formula.



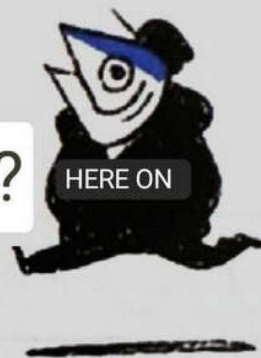
However, basic understanding of light and color is essential when painting, so in this book, we will look at various concepts necessary for coloring.

Reference as needed



## PART 01

What are light and color?

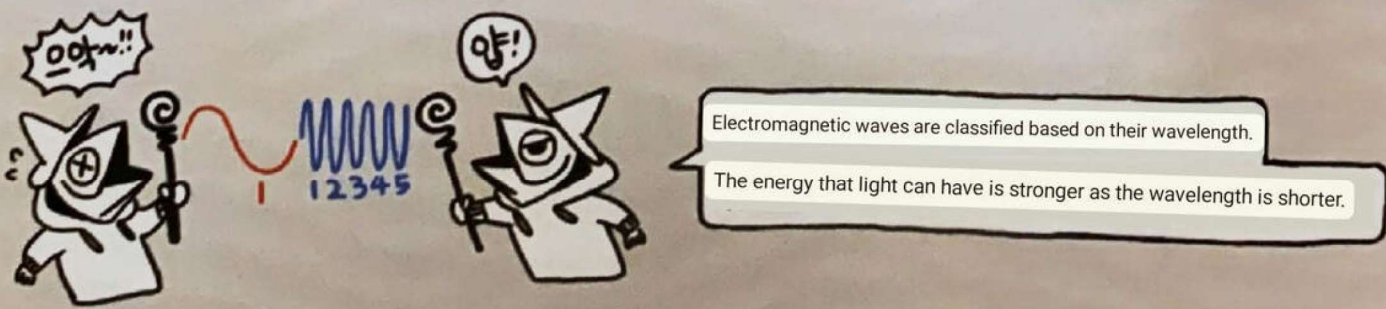
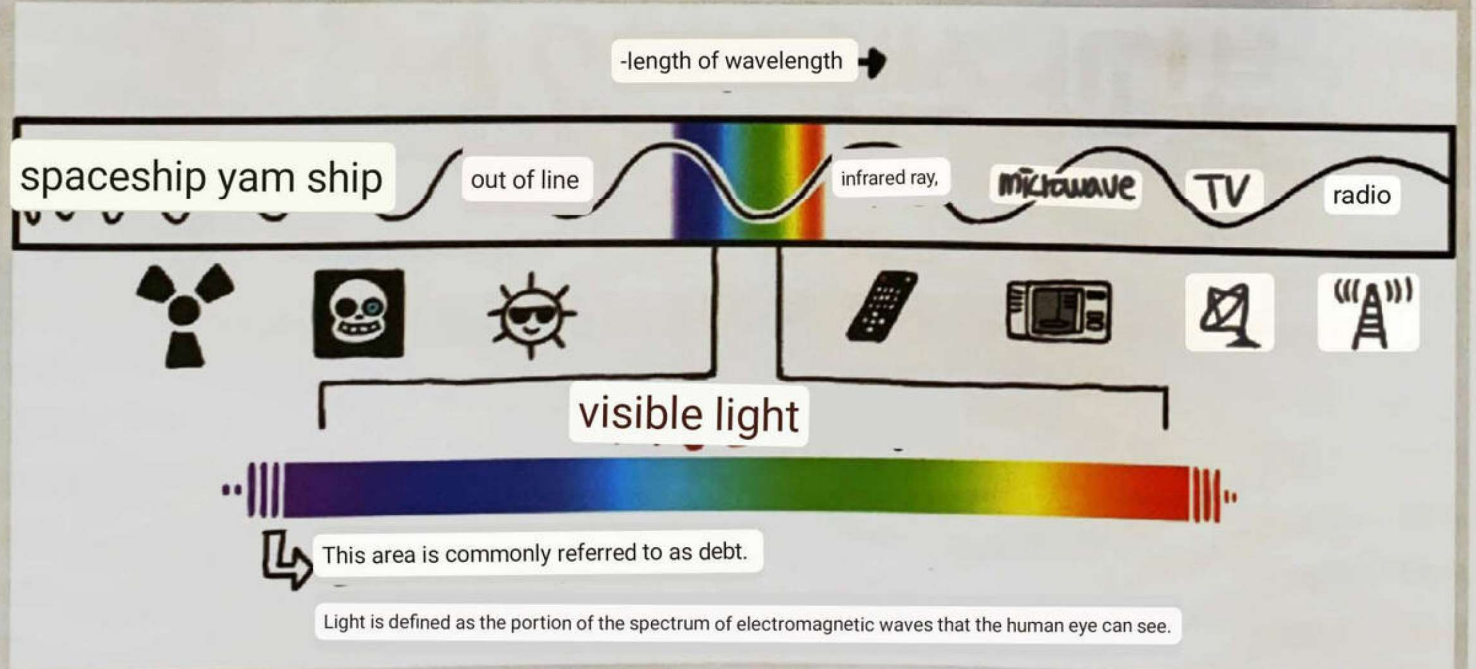
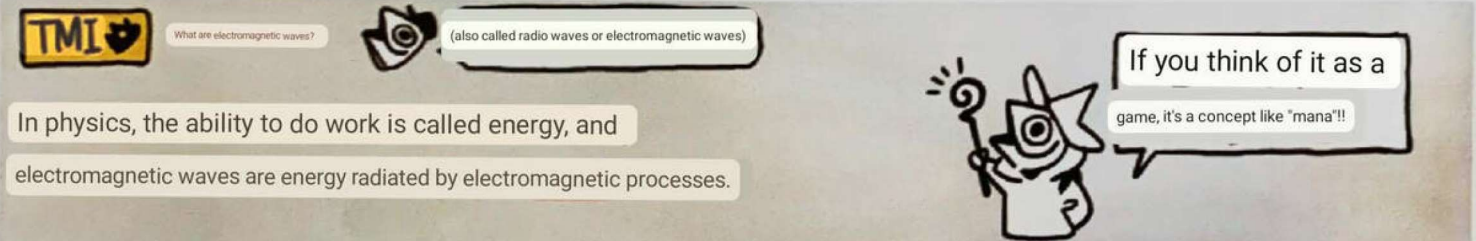
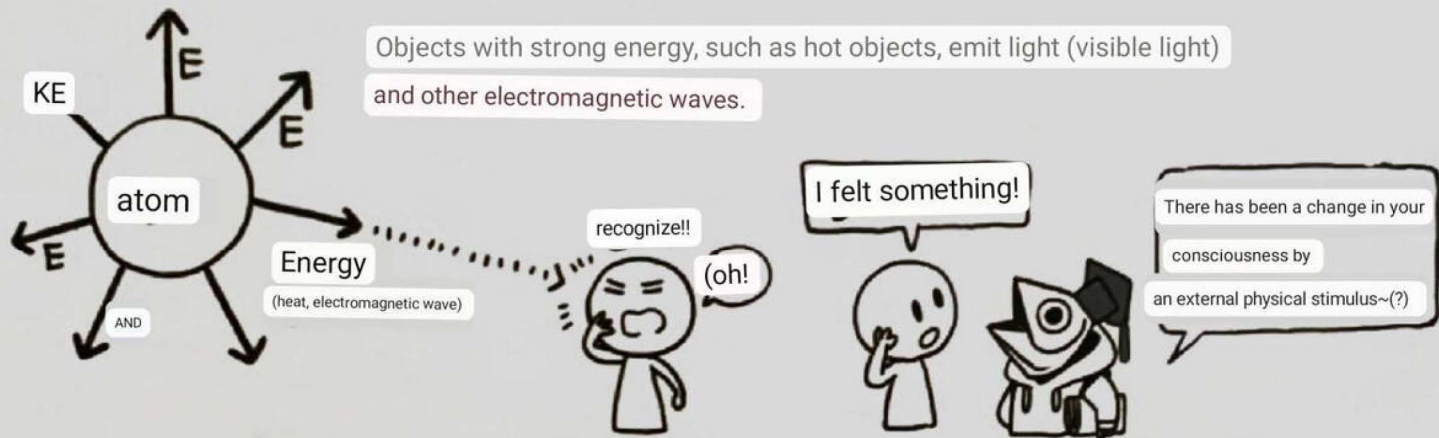


HERE ON

# 1\_Light

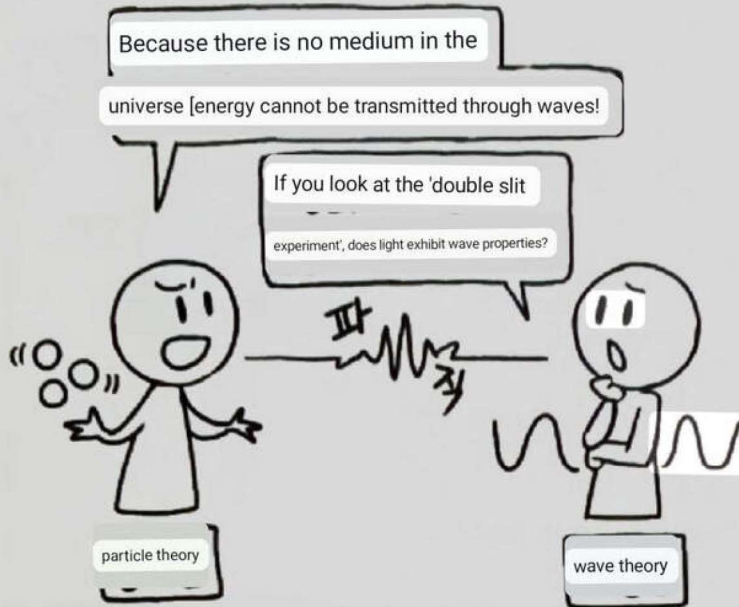
## 1. What is light?

Among the many energies that exist in the world, the energy that illuminates the world we live in is called light.





## ► Is light a particle or a wave?



## Photoelectric Effect Episode 2 The

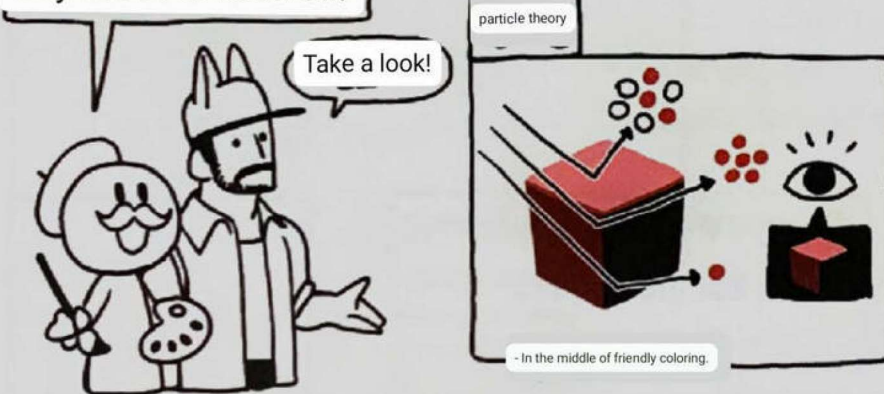
double slit experiment was controversial about the nature of light, but Einstein proved the duality of light.



Light has both particle and wave properties.

Painters who deal with color have no problem in coloring objects even if they understand light as particles.

## Why does red look red?



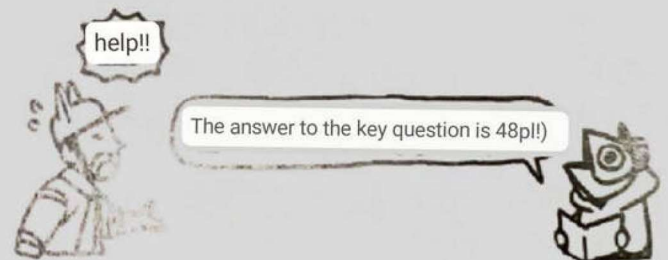
It is easy to understand if the phenomenon representing the 'color' of an object, such as reflection and absorption, is interpreted as 'photon'. (Actually, even if it is absorption/reflection of wavelengths...!)

When coloring a character, 7 is enough! /

But why is the sky blue and why is the sunset burning?



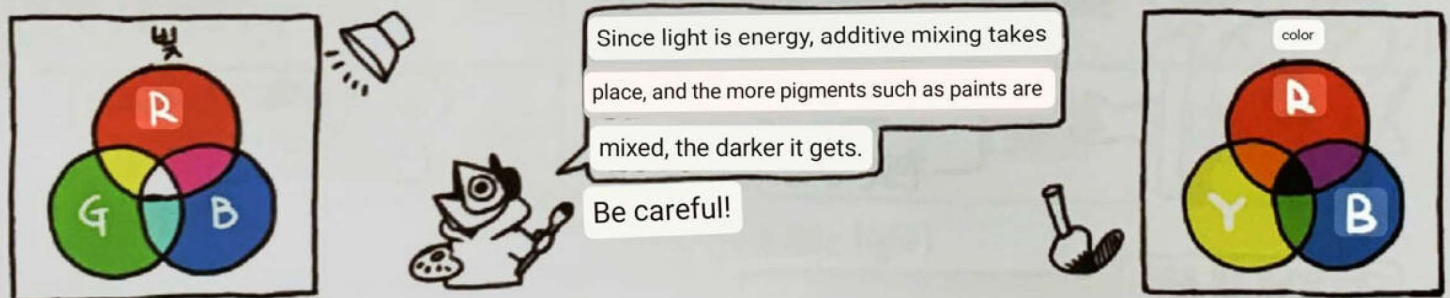
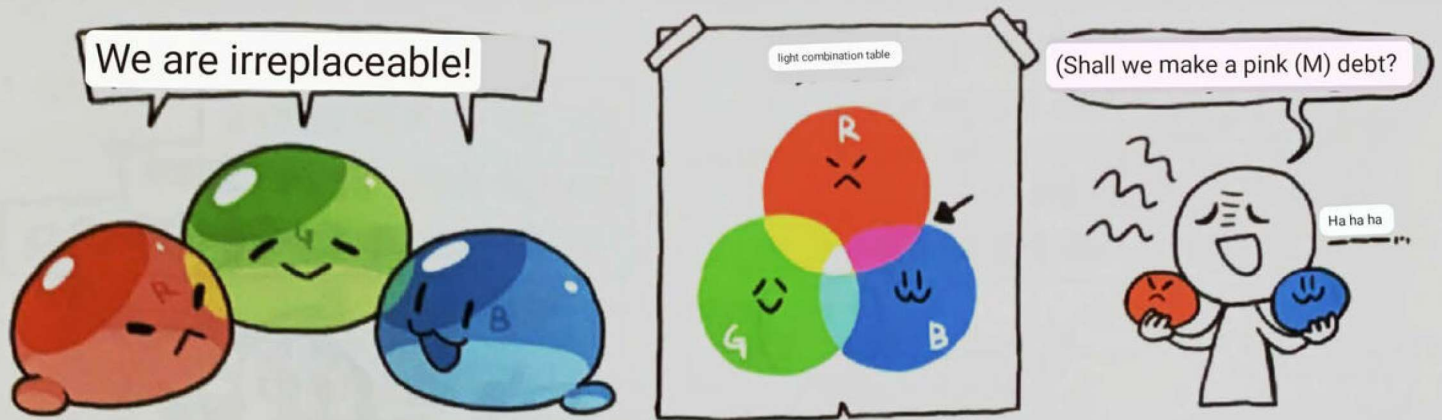
However, in order to understand and express all the various colors of nature, it is useful to know that light is energy with wave properties.



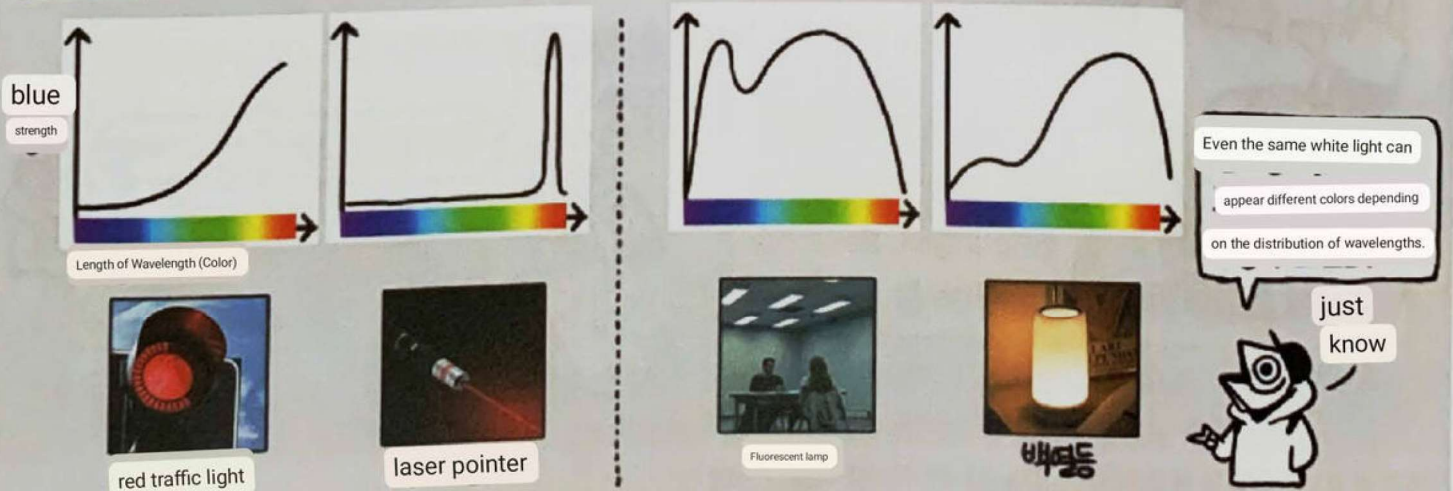
1) Double slit experiment: When a test subject is passed through a double slit and has the properties of a mass wave that distinguishes wave and particle properties, an interference pattern appears on the rear screen. 2)

Photoelectric effect: A phenomenon in which a substance (particle) such as a metal emits electrons when exposed to light

## 2. Additive mixing with the three primary colors of light



In general, a particular color of light actually has several wavelengths.

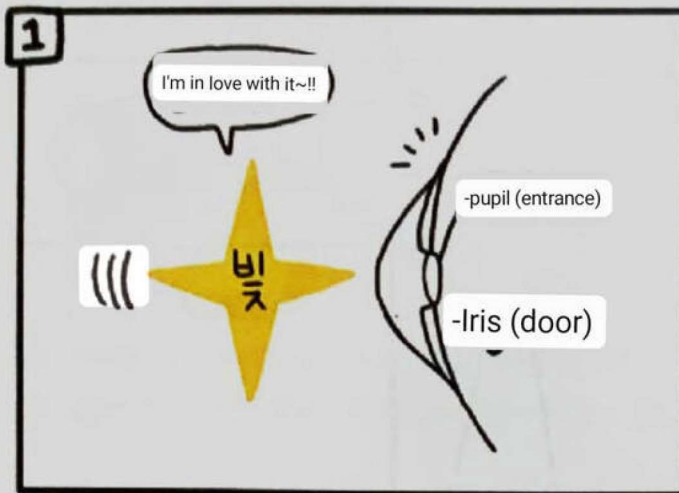




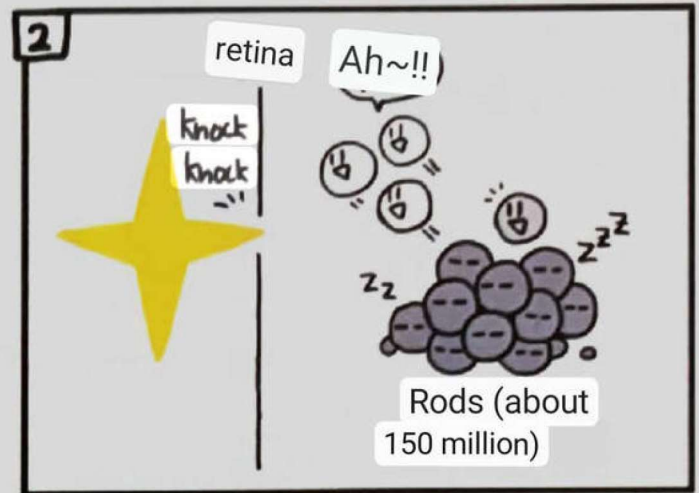
### 3. Until light is perceived as a color

Different colors of light, visible light, take on different colors depending on the length of the wavelength.

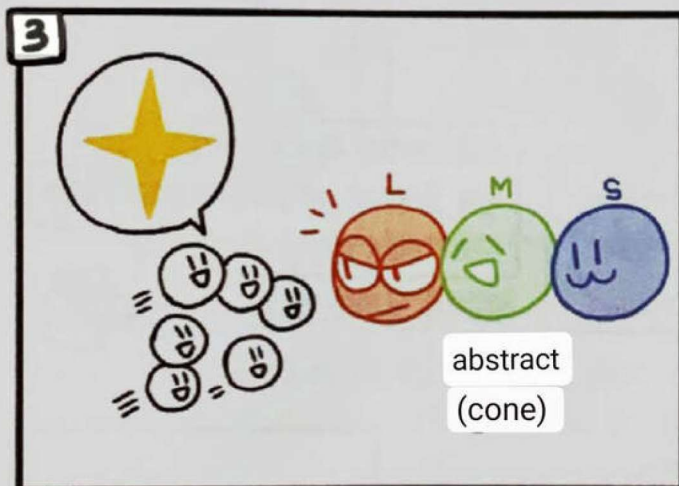
So, how can our eyes distinguish the difference in wavelengths into different colors?



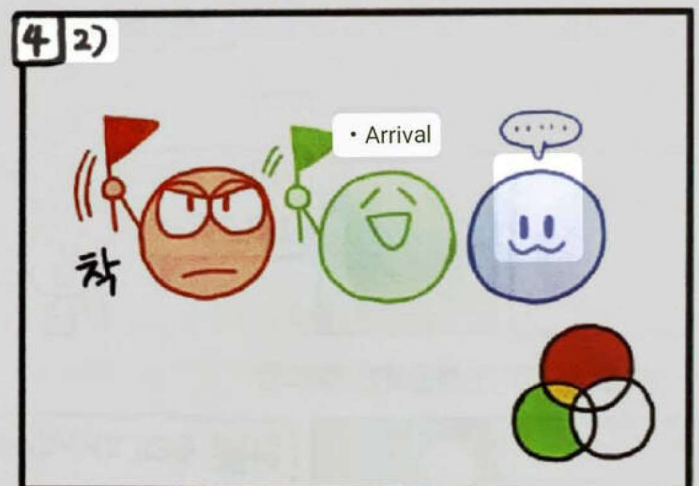
When light reaches our eyes, it travels through the pupil to the optic nerve.



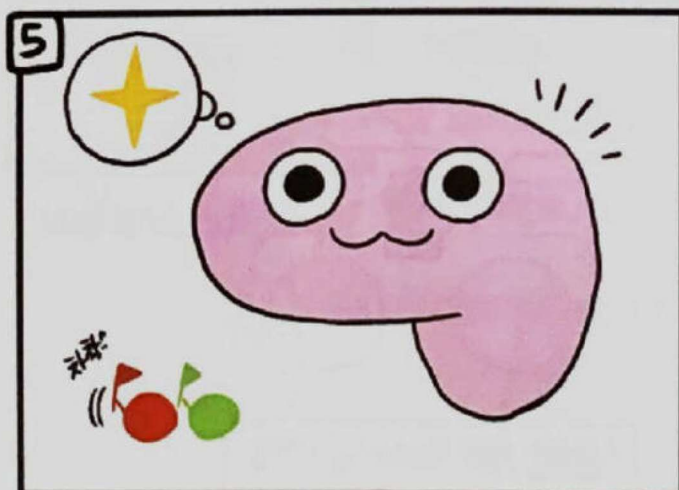
Upon reaching the retina, it excites rods and cones. Rods detect light intensity (contrast).



When the rods detect enough light, the cones discriminate the color.



Each cone is activated by the wavelength of the light.



The brain perceives the finally arrived information as a color.

In other words, color is a synthesized subjective sense that the brain feels.

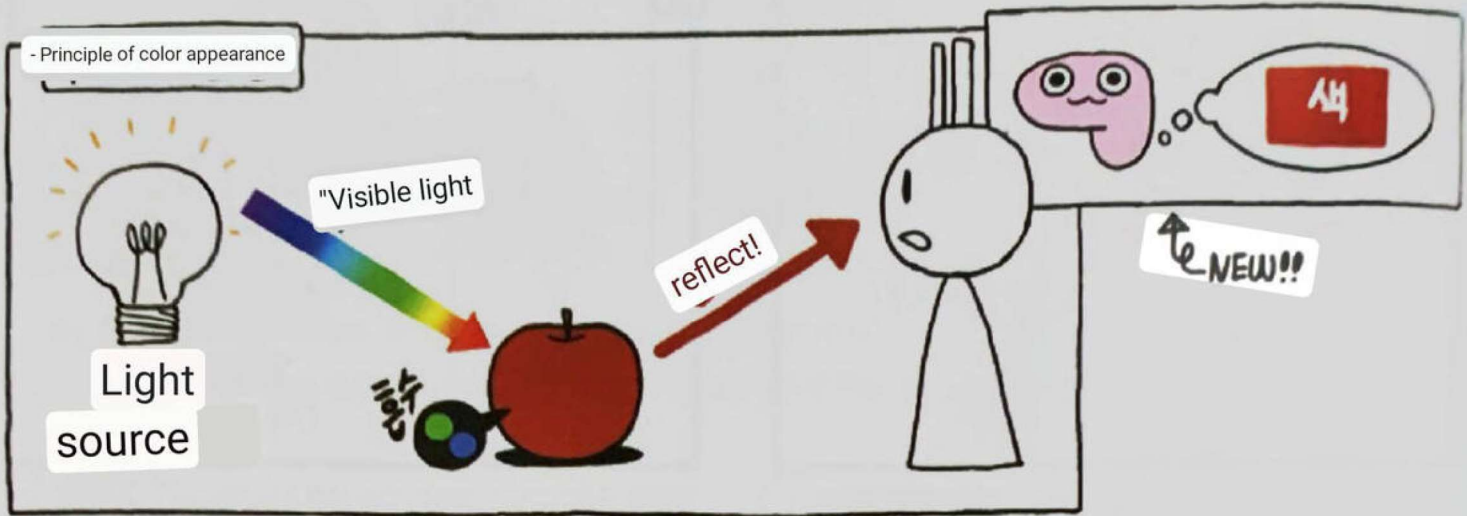
#### Be aware!

- 1) The rods must be sufficiently active for the cones to discriminate colors well. Therefore, it is difficult to distinguish colors well in dark places.
- 2) In this case, we assume pure yellow light.



## 2\_Color

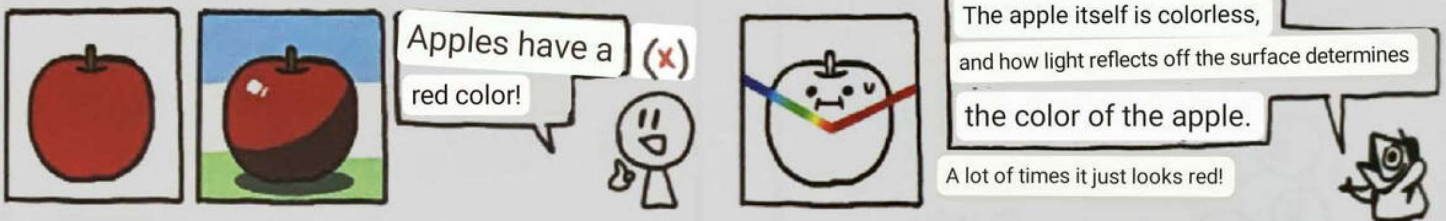
### 1. What is color?



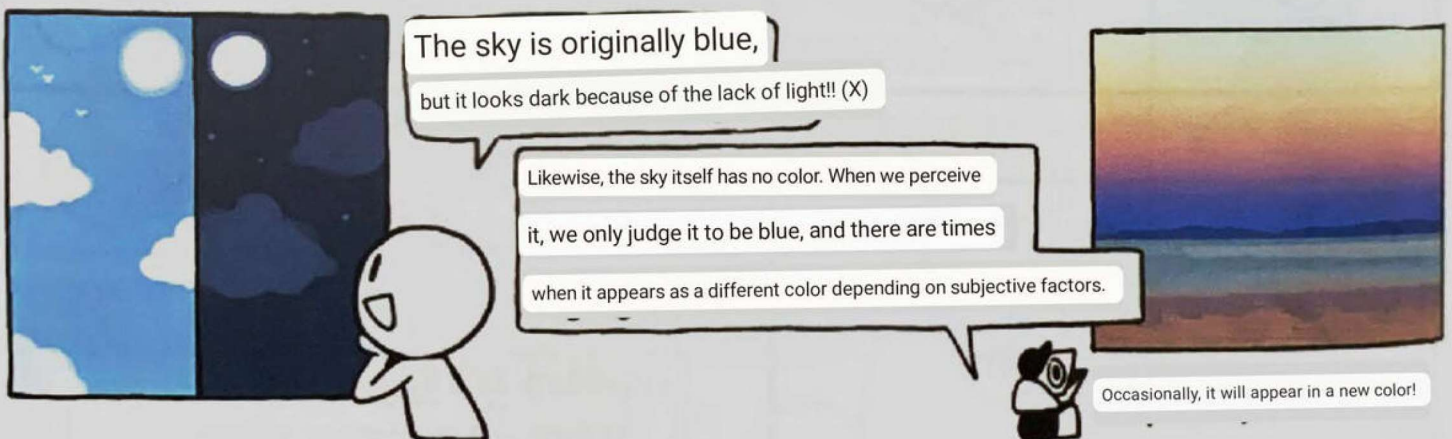
• As a dictionary definition, color refers to visual elements such as the contrast or color tone of objects that appear through light absorption and reflection.

In addition, the following errors can be fixed if you understand and come across the light before.

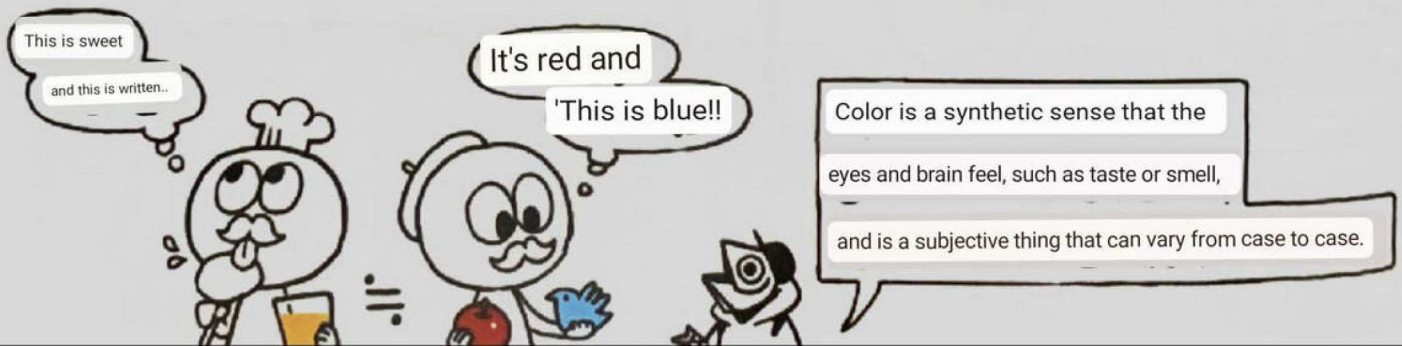
#### ► Is color a unique element of an object?



#### ► Is it an objective thing that actually exists?



Color is not a property of an object, but a subjective sense that can be perceived differently by the visual organ depending on the light conditions.

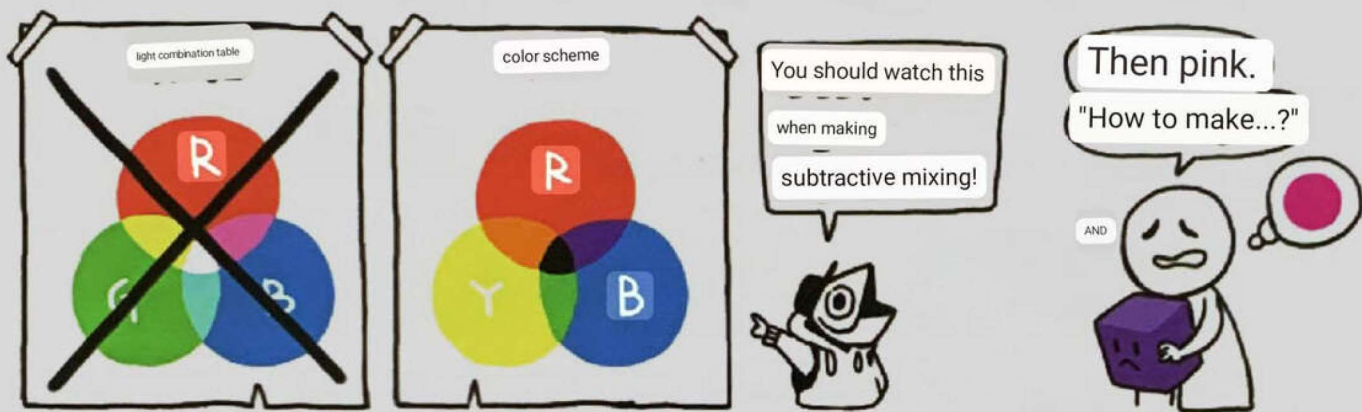




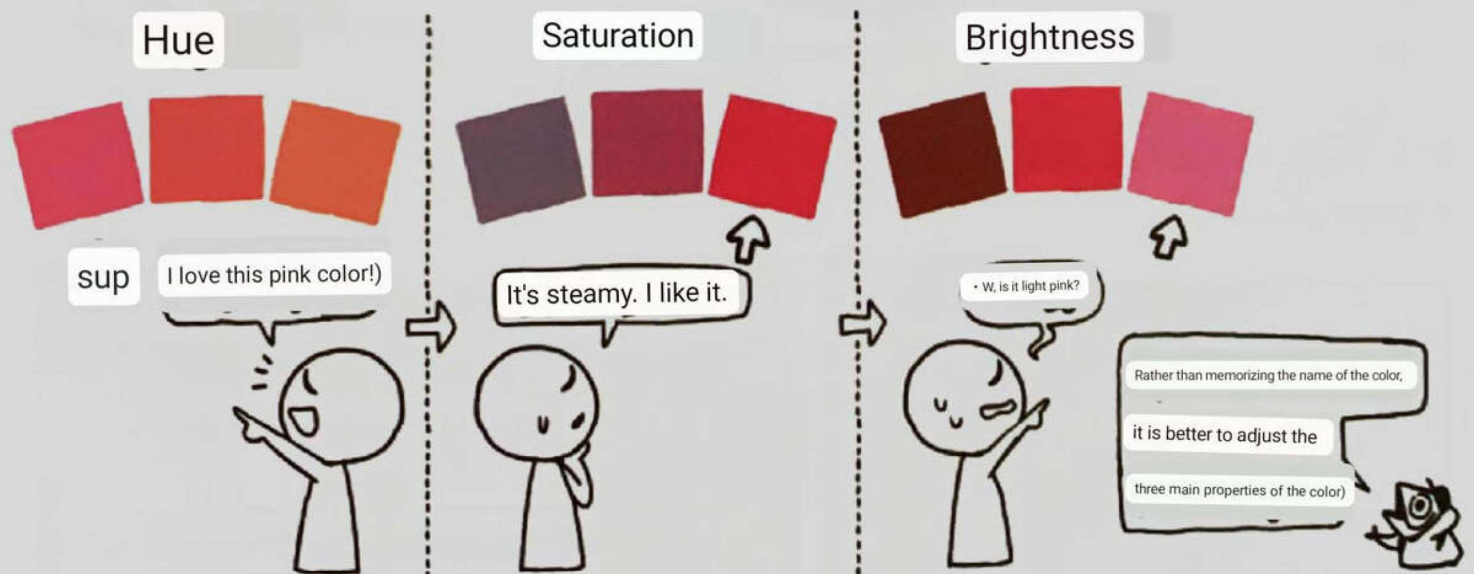
## 2. The three primary colors and their three properties



Like the three primary colors of light, there are three pure colors that are independent of each other. These are called the three primary colors of color. The three primary colors of colors can also be combined to create all colors, but because subtractive mixing is done, it gets darker and darker.



All 'hues' can be created by combining the three primary colors of colors, but not all colors can be created with color alone. Each color has three properties: Hue, Saturation, and Brightness, Value. Therefore, to create a desired color, you need to know the hue, saturation, and lightness of that color.



## 2-1. Hue

[Nice to meet you, boy!]

I call it the color wheel!



These are the colors that  
can be seen in wavelengths of light!

You can see almost  
any color!

The names of colors, such as red and blue, are usually used to refer to the value of the color among the properties of the color. It is often called together with words that describe lightness and saturation, such as bright yellow or vivid red. Some colors have different names depending on their saturation or brightness (ex. brown = dark orange).

You can't see pink on  
the color wheel?!

"I" is a  
bright  
red one!!

This is because the same hue (hue) is sometimes  
called a color with a different name depending on the saturation  
and brightness, which will be explored later.

The concept of integrating lightness and saturation  
into a color is called a tone.

## 2-2. Saturation

I have more red  
color (Hue) Saturated!!

I... the  
saturation is a bit low...

Saturation is relative, so  
don't worry. ~

This content is very  
important to us!

There is a limit to the  
expression of saturation!

We call it achromatic ♡

Black color

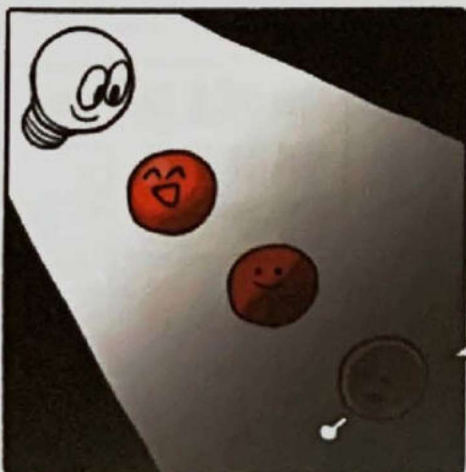
흰색

==

It is said that the more vivid and pure the color of a color, the more saturated it is. The more opaque the hue of a color is, the less saturated it is, and thus the saturation is relative. Black, gray, and white where no color appears at all are said to be achromatic.

## 2-3. Brightness, Value

### ① Brightness



The brightness...  
the saturation...  
is not enough.

Brightness is a property that distinguishes the lightness and darkness of a specific color.

The brighter the light, the closer the color is to white, and the darker it is, the closer it is to black.

Light is the energy that makes an object bright.

The more the color is affected by light, the higher the brightness.

If the light intensity is not appropriate, the color saturation will be rather low...

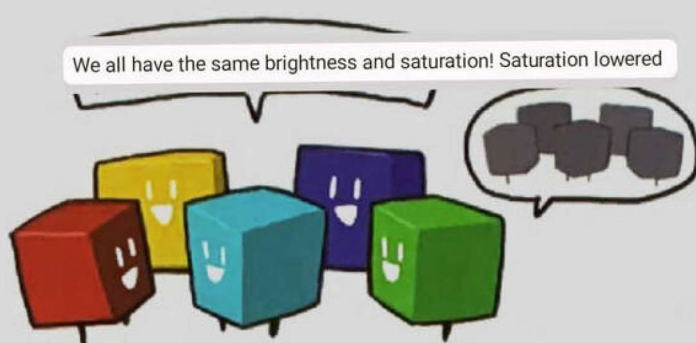




## 2-4. Value

When we talk about brightness in color, we sometimes refer to a separate concept called Value. This is because

even colors with the same saturation and brightness values in the hue table may look different depending on the color.



When you want to quantify the brightness of a color, you can look at the final brightness of a color that appears according to the 3 properties of a color (hue, saturation, and brightness),

and quantify the brightness of a color as a value independently of the brightness value of the color.



The higher the saturation,

the more pronounced the difference in value for each color.



at high saturation



Silver value is bright,

•Blue and purple are dark in value.

Even if the brightness of various colors is constant,  
if the brightness of the final color is different,  
you should check the value, not the brightness.

Even with the same brightness and saturation, the value can be handled according to the color!

채도 100%



채도 100%



If you consider the  
value when using colors,  
you can color naturally even  
if you use  
a variety of colors!



The lower the saturation, the  
smaller the difference in value per color,  
so you can select a color relatively easily.  
However, when using a color with  
high saturation, you must check the value.



### 3\_Points to note when coloring in digital painting

Earlier, we talked about light and color, and studied addition and subtraction mixing. Let's look at an example of how these colors are mixed.

Lighting (additional mixing)



The more light you add, the more intense and saturated the color becomes.

As more light is added, the saturation gradually decreases, but...

. haha..

Watercolor (subtractive mix)



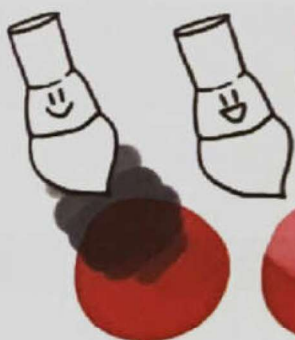
The color gets darker with the pigment!

However, digital coloring does blend in a different way than in the example above when colors are mixed.

Therefore, when coloring the expression of color by light, it is difficult to color naturally.



Add opacity! [



You can change the name easily, but...



When different colors are mixed, the brightness or brightness It does not change constantly.

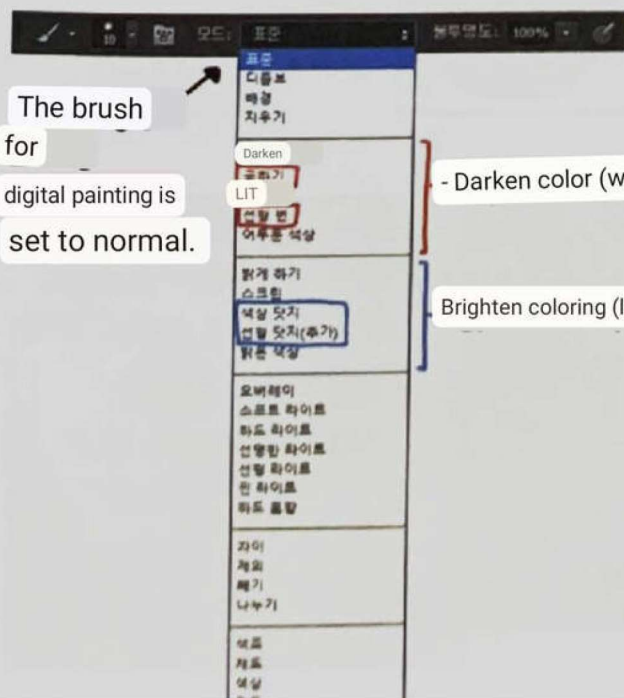
(Of course isn't it?)

However, it is very important to control the saturation to express 1 light!

Additive mix(?)

Subtractive mix(?)

By changing the settings in a digital painting tool such as Photoshop, you can color by changing the way color mixing is calculated.

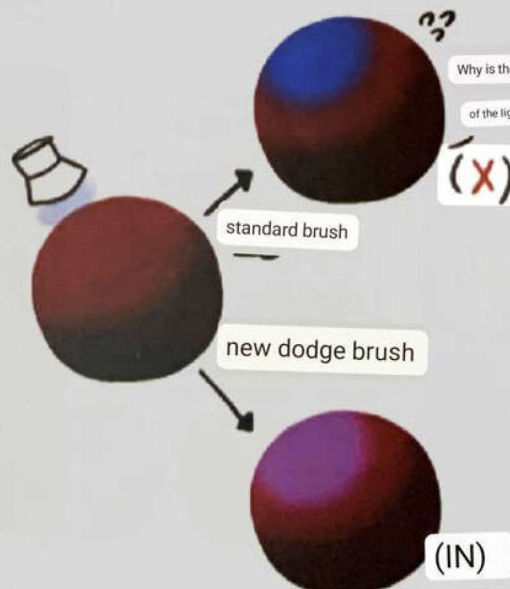


The brush for digital painting is set to normal.

- Darken color (watercolor)

Brighten coloring (lighting)

ex) What if you add blue light?



Why is the saturation of the light-dark boundary like this?

(X)

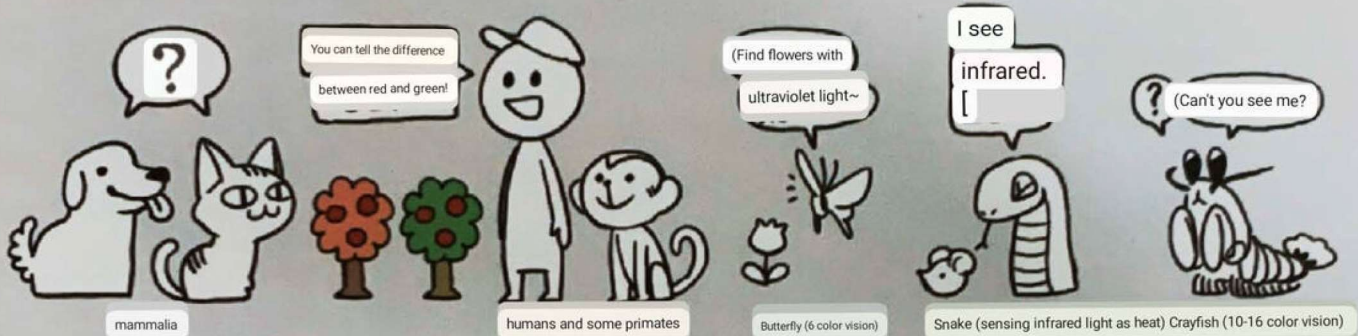
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## ► Are infrared and ultraviolet rays invisible?

The human visual system can usually distinguish more than 10 million colors. Humans usually distinguish colors through three cones, but sometimes, tetrachromats can distinguish colors more delicately than normal people. However, with the exception of some species of primates, most mammals do not distinguish well between red and green. However, some animals other than mammals have more than four color vision. Insects can see ultraviolet light, and snakes can see infrared light indirectly. The crayfish is famous for being a creature with 16 angles of color vision.



## ► The link between color and language

Former British Prime Minister William Glaston (1800-98) was a famous bookworm, especially the ancient Greek citizen Homer. Glaston makes an interesting discovery while reading Homer's work. Blue never appears in Homer's work. He concludes that Homer and the ancient Greeks were all color blind.



In fact, the word blue did not exist in ancient Greece. In ancient texts, the colors black, white, red, and green and yellow only gave rise to the name of the color blue. In fact, the Himba of Africa have different names for yellow, green, and blue, so they can easily distinguish colors that we cannot distinguish, and cannot distinguish colors that we can divide our households.



## PART 02

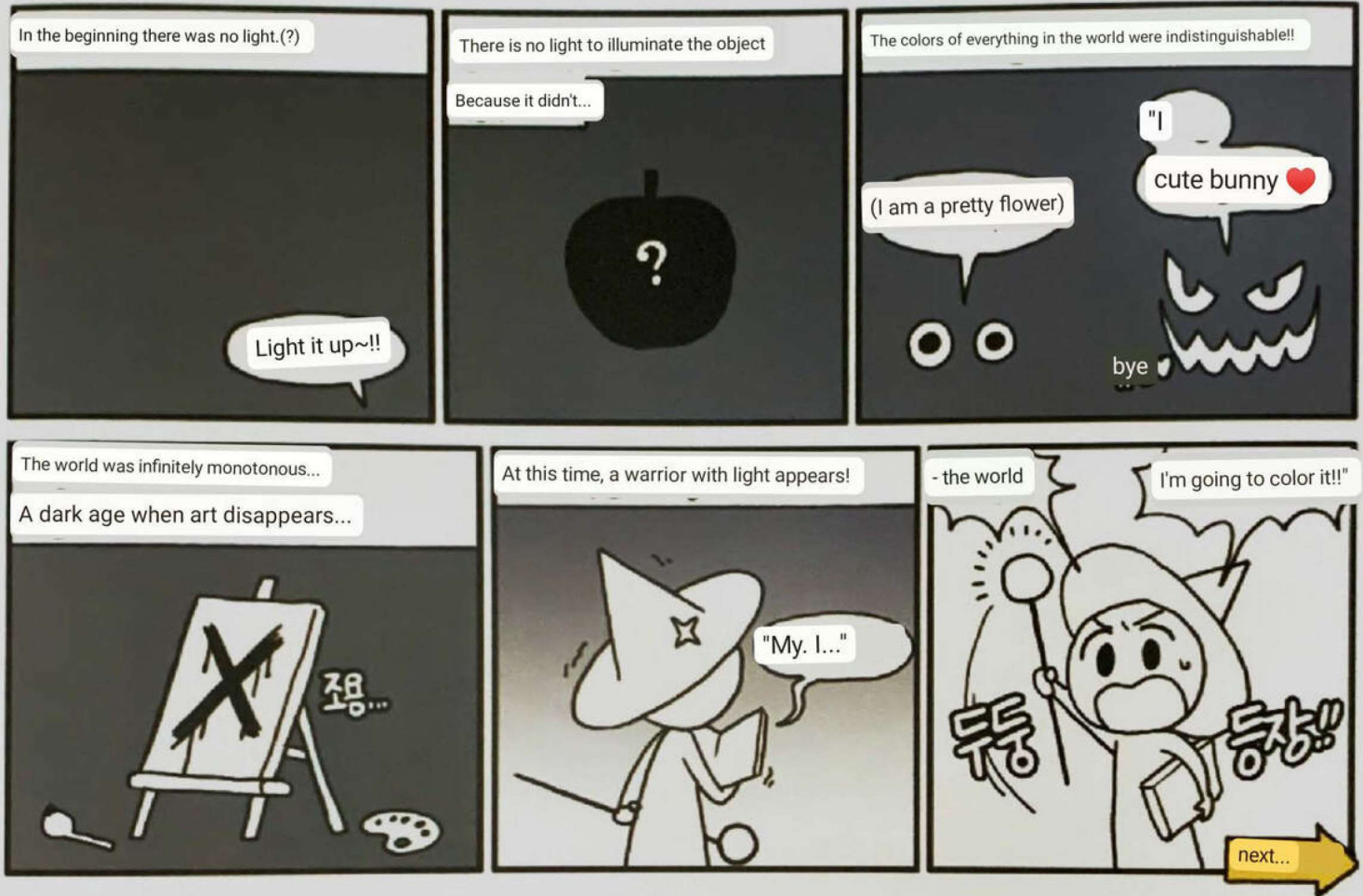
light





## 1\_ Basic practice of light and color

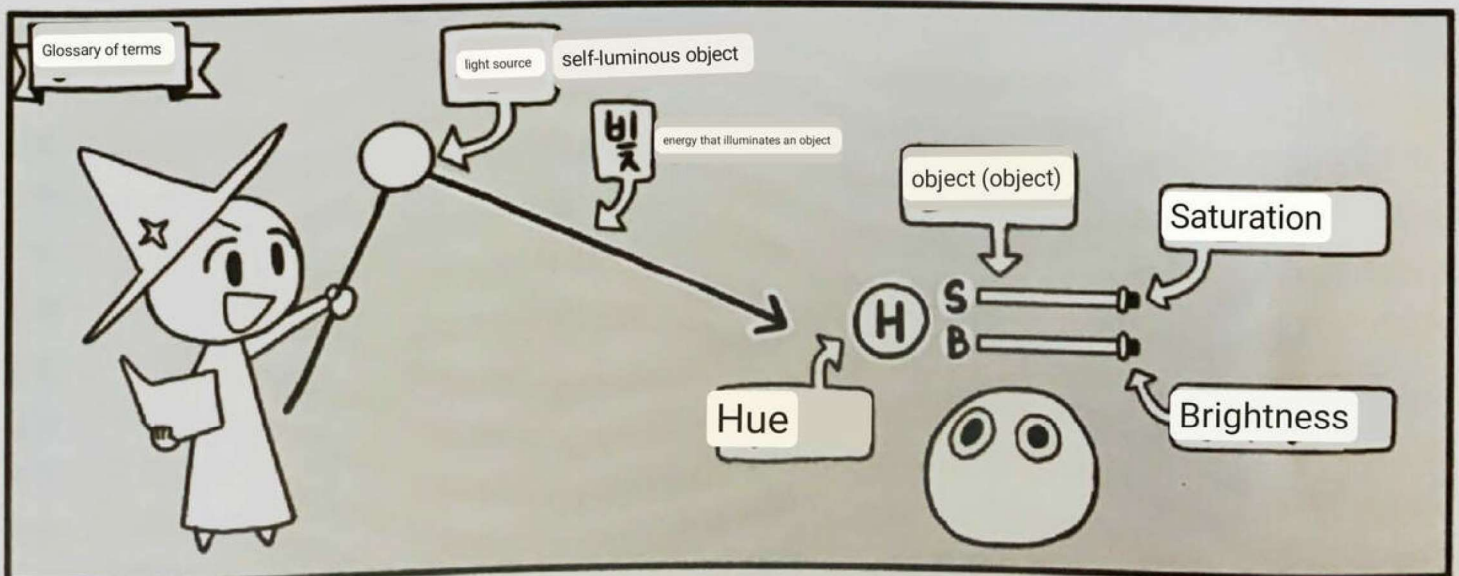
### 1. Effect of light on color

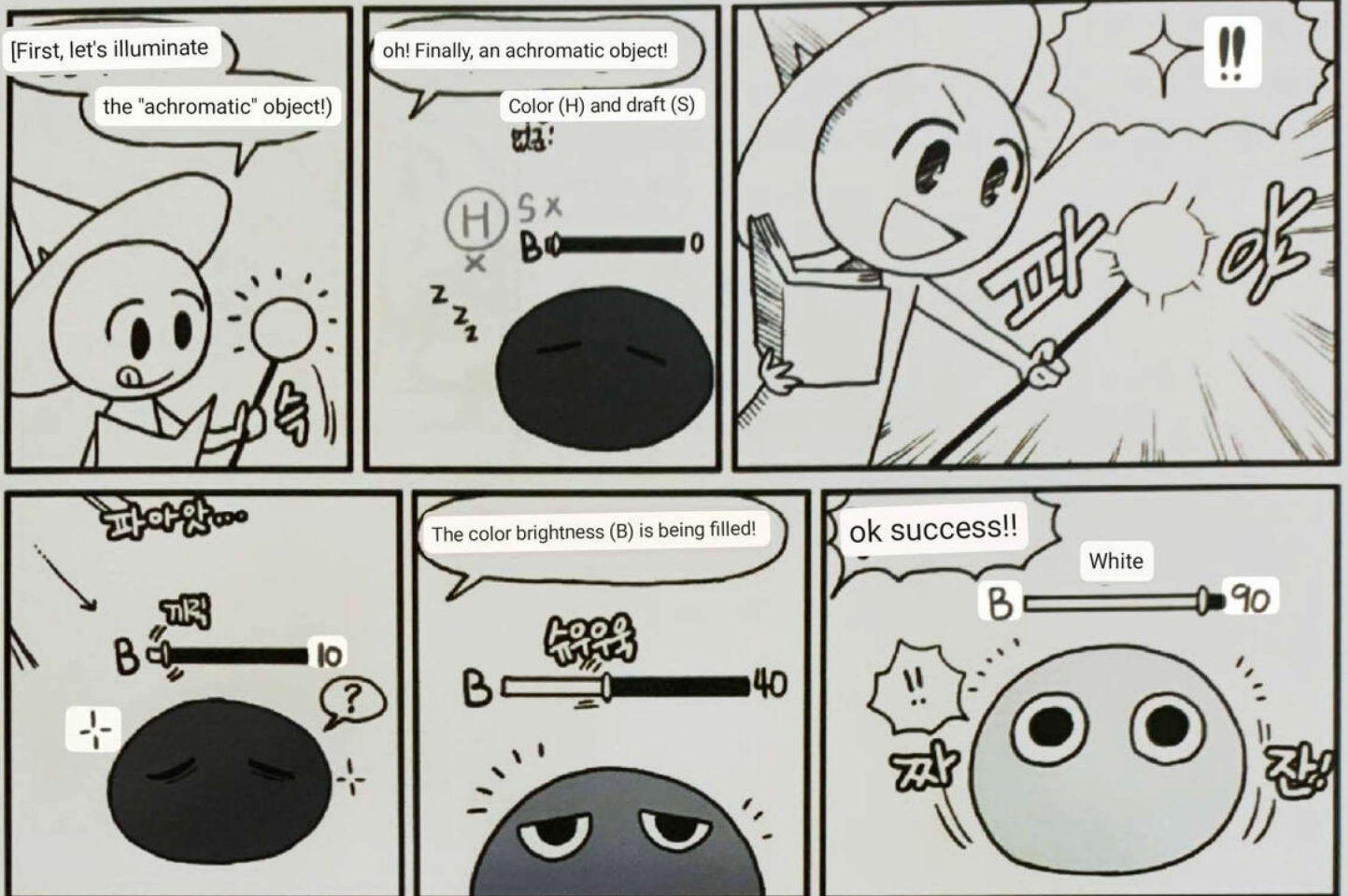


The reason we can see objects in the world with our eyes and distinguish them by color is because of the existence of light.

In a world without light, the eyes cannot perceive the color or even the

shape of an object. Now that you know about light and color, let's look at how light affects color.

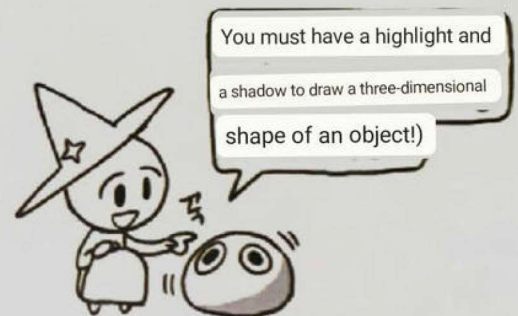
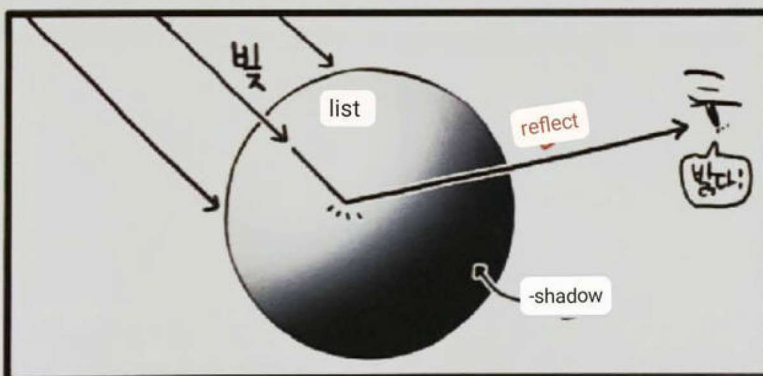




1) Achromatic color A color that has no color value and therefore no saturation (S) value.

When light hits the object to be observed and the object reflects the wavelength, the color brightness of the object increases. Here, the areas where

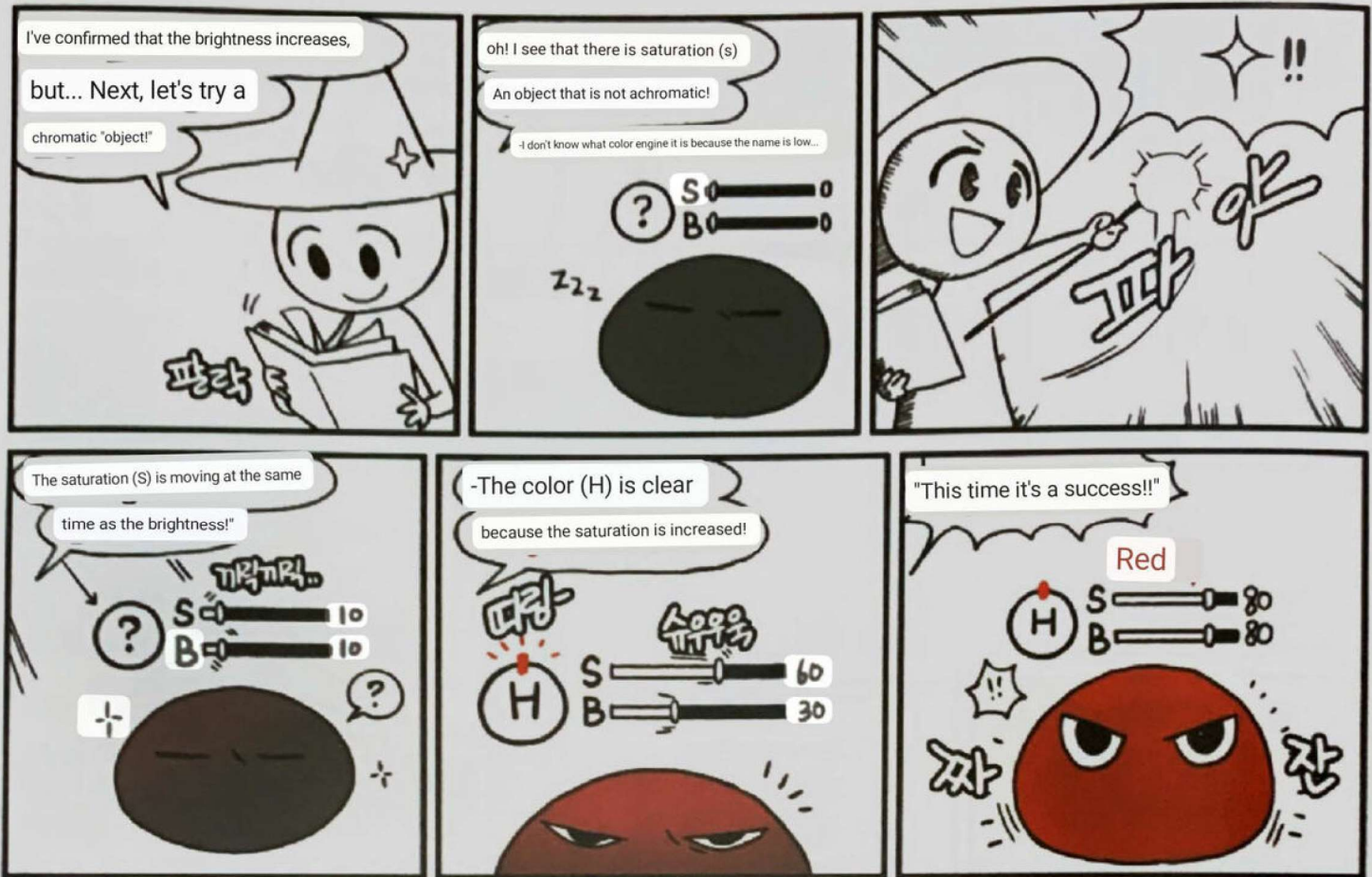
the light hits and reflects brightly are divided into highlights, and the dark areas where the light does not reach are divided into shadows.



Every object absorbs light of a specific wavelength, and black among achromatic colors absorbs all spots, so it doesn't reflect light, so the brightness doesn't increase. Conversely, white can reflect all wavelengths.



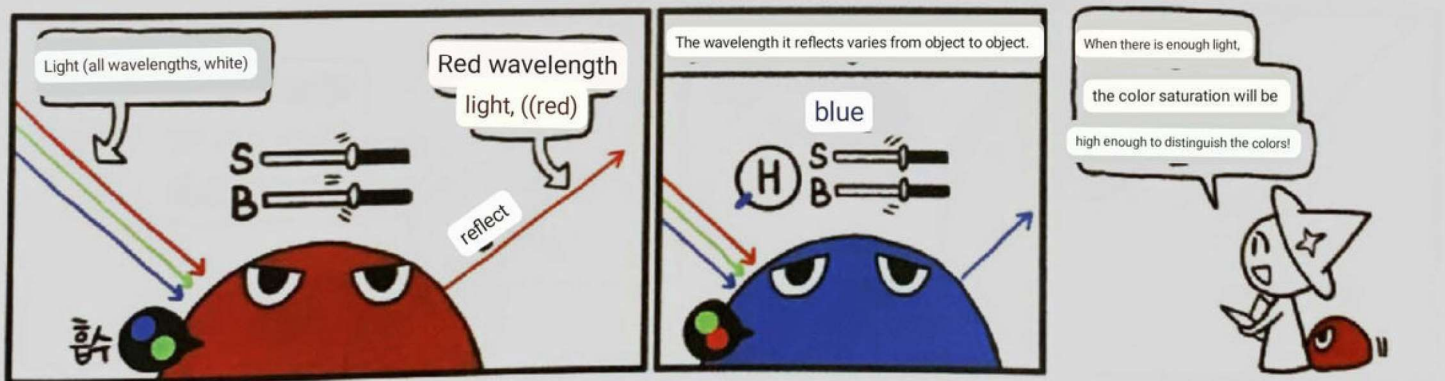




1) Chromatic color: A color with a specific hue (hue) Saturation is determined according to the vividness of the color.

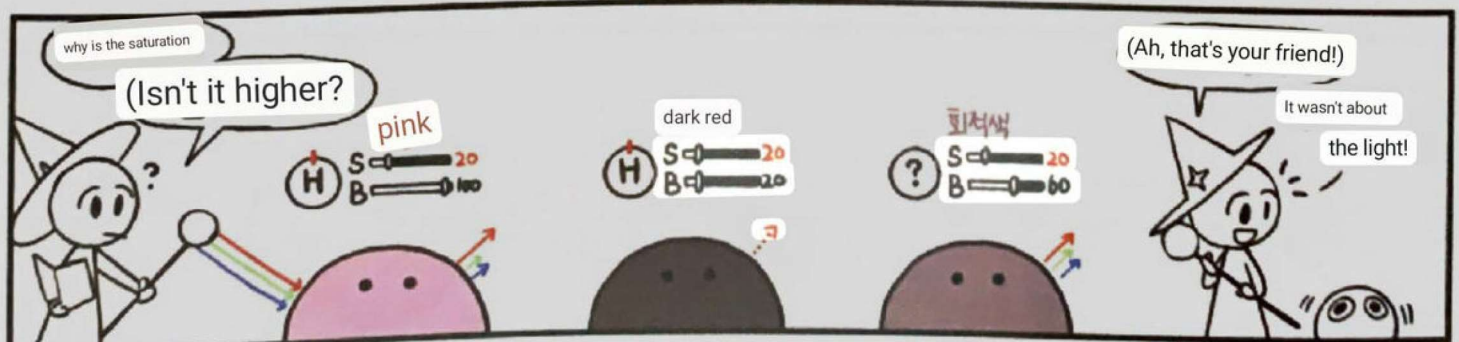
When an appropriate amount of light reaches an object that is not achromatic, the object can absorb certain wavelengths and reflect the wavelengths of a given color.

It is said that the light reflected from here and reaching our eyes becomes a color, and the more vivid the color, the higher the saturation.

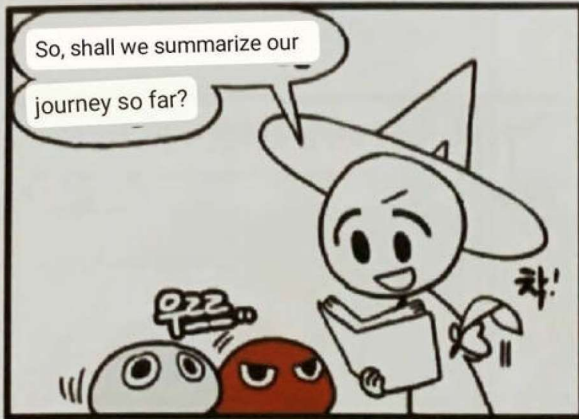


Because the specific wavelength that an object can reflect is also limited by each object, some objects do not become

saturated no matter how strong the light is. These colors are called hypochromic, and achromatic colors are also non-saturated colors.



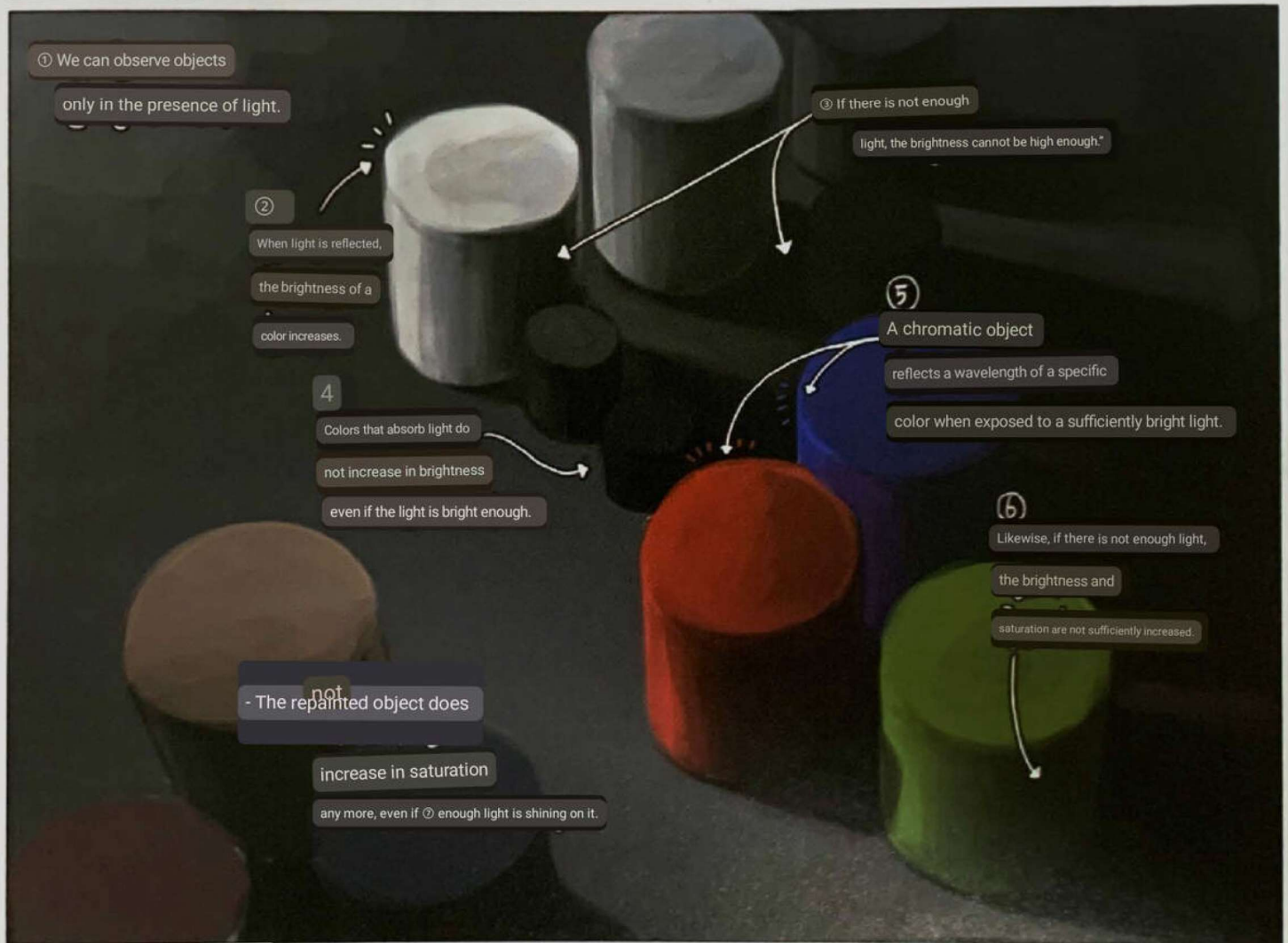




for a moment!

The relationship between light and color is especially important for the basics, so it is helpful to understand the content later if you know it carefully!

Basic terms and principles...



1) This is called a shadow.

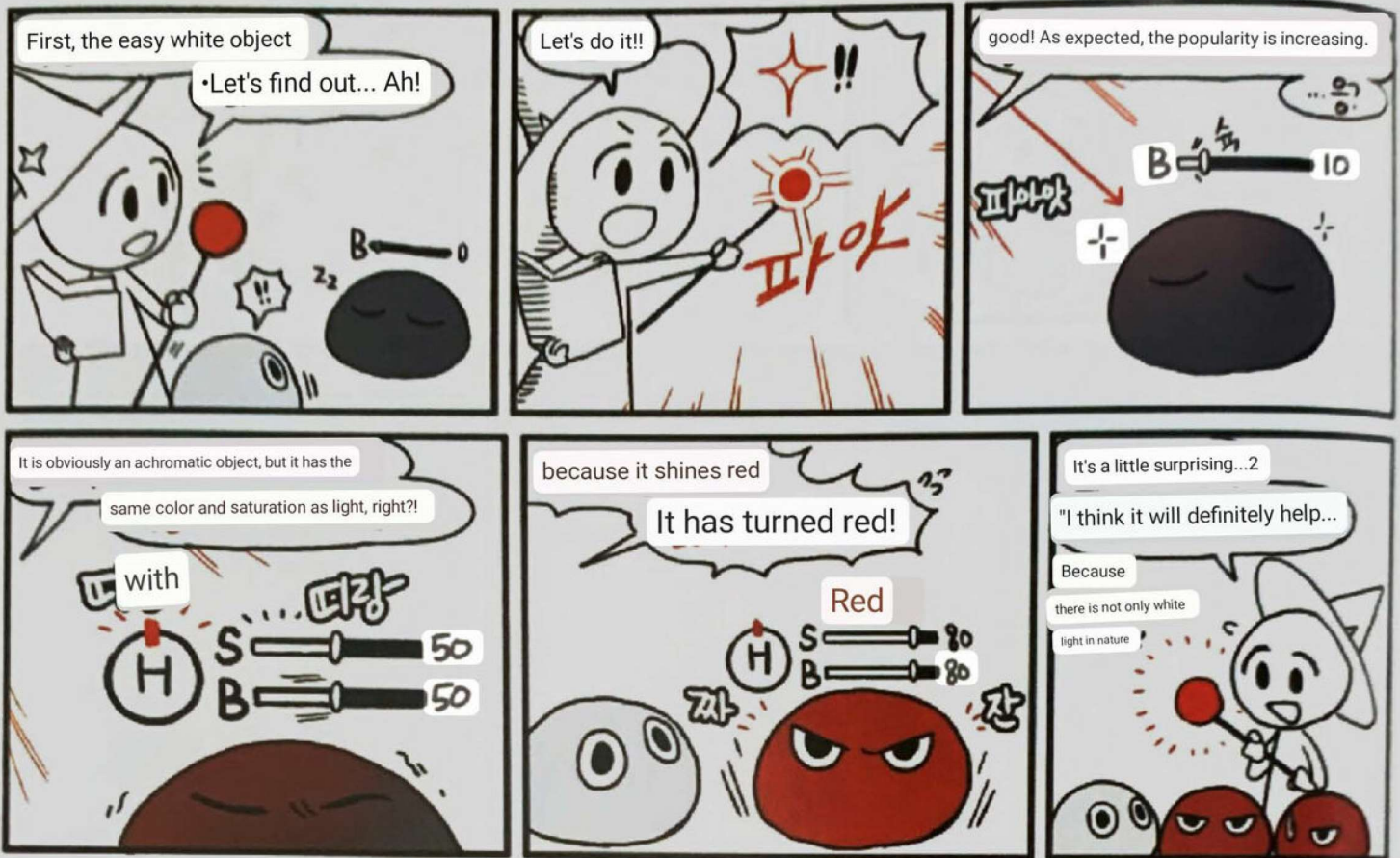
2) This is called reflected light.

It was said that a three-dimensional form appears only when there is a highlight and a shadow...

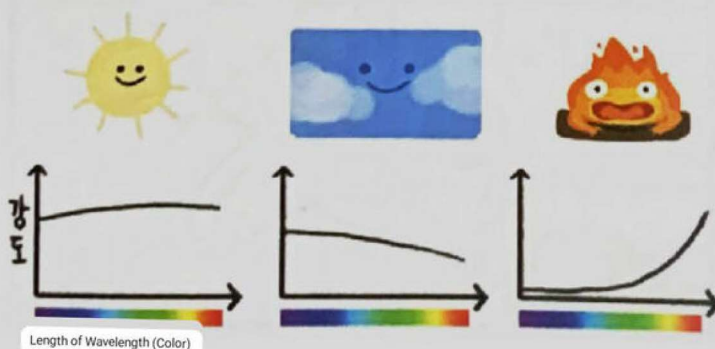
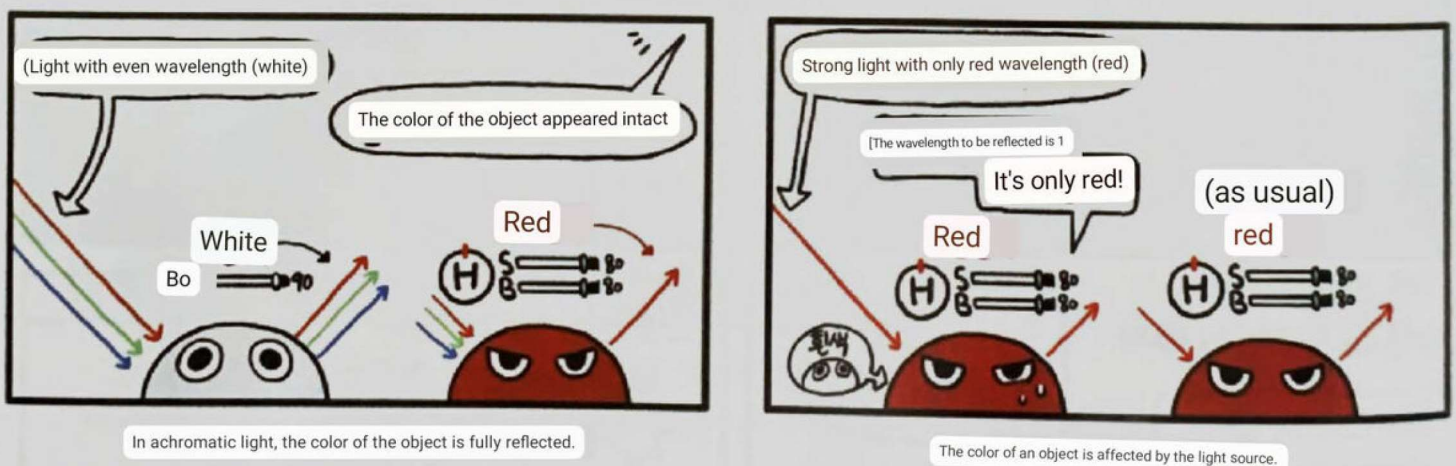




## 2. The color change of an object due to the color of light



Light with the same intensity of all wavelengths becomes white (achromatic) according to additive mixing. However, light with a relatively strong region of a specific wavelength (ex. red) takes on a specific color (red) depending on the wavelength. Since light has relatively weak intensity at different wavelengths, it cannot fully illuminate the color of an object. The color of an object is affected by the light source, so the color of the object changes according to the color of the light source (light).



It's a must-know because there is no perfect

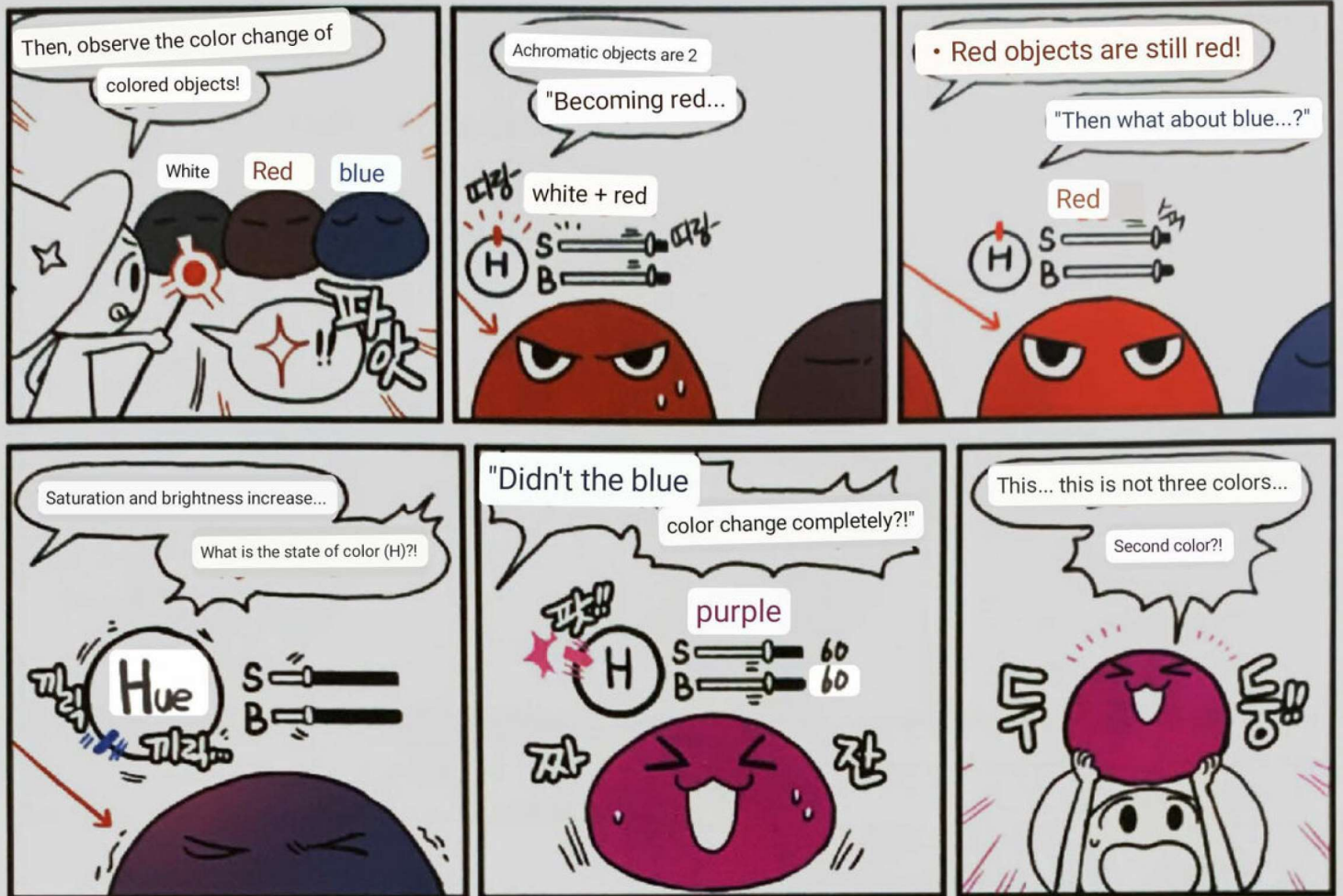
The color change of an object due to the color of light

white light in nature!

Because the color of light is made with the combination of RGB!





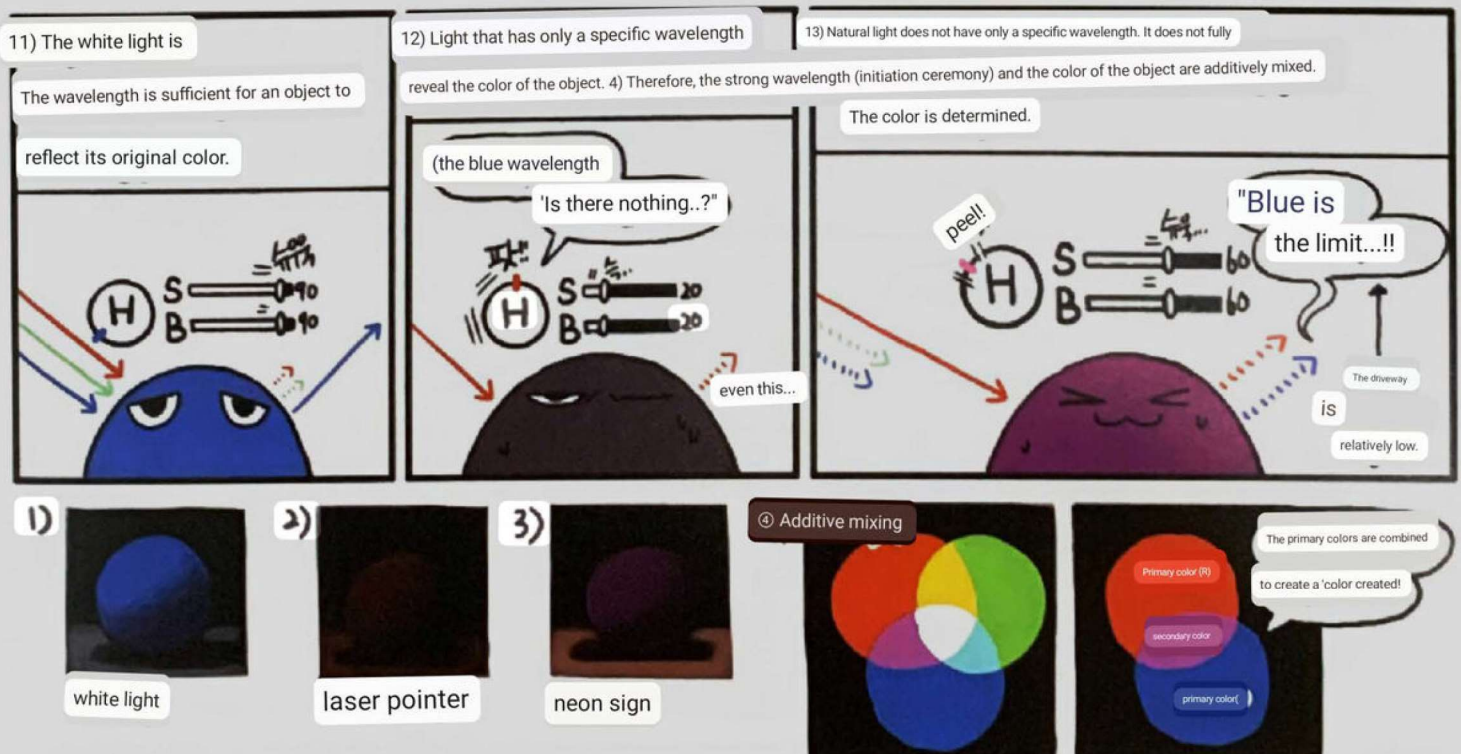


If so, what color will the object change when light of a certain color is reflected from a chromatic object? Each object

has a specific color that can be reflected. If the intensity of the wavelength of light is sufficient, it reflects vividly (high-saturation, high-brightness), and if the light lacks that wavelength, it reflects it weakly. White

light with a constant intensity of all wavelengths can show the original color of an object, but chromatic light (light with a strong specific wavelength)

does not illuminate the object sufficiently or changes the color of the object. At this time, the color change depends on the additive mixing.

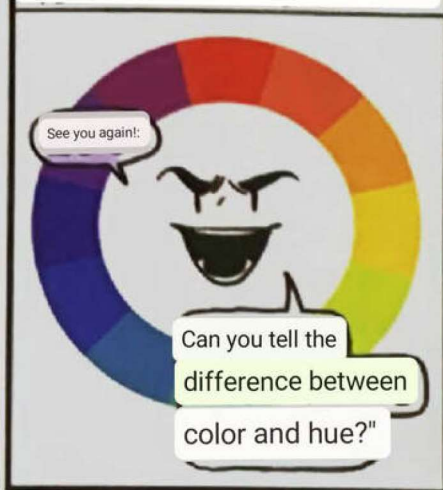




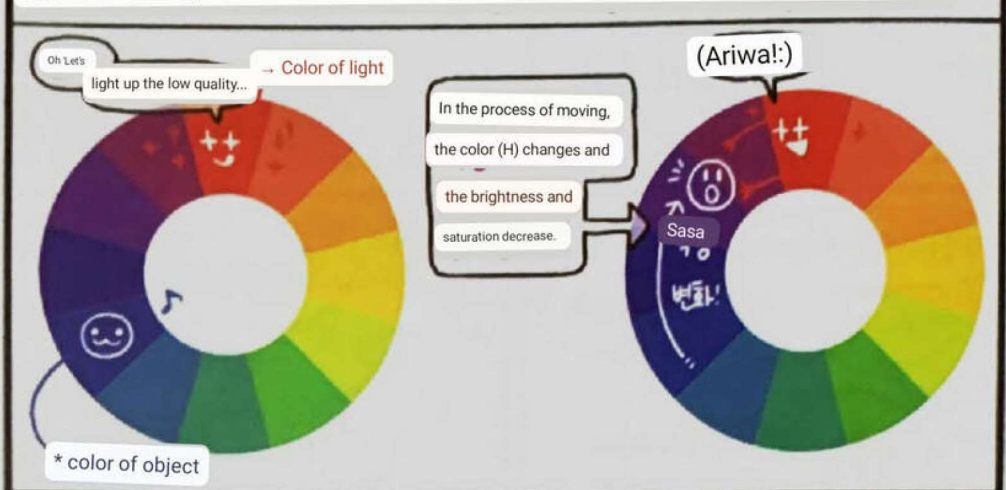
## Understanding the color wheel

Although we have theoretically examined the fact that the hue of an object changes depending on the color of light, it is difficult to intuitively understand the change because color is a property of color, not light. Changes in color can be viewed through the color wheel.

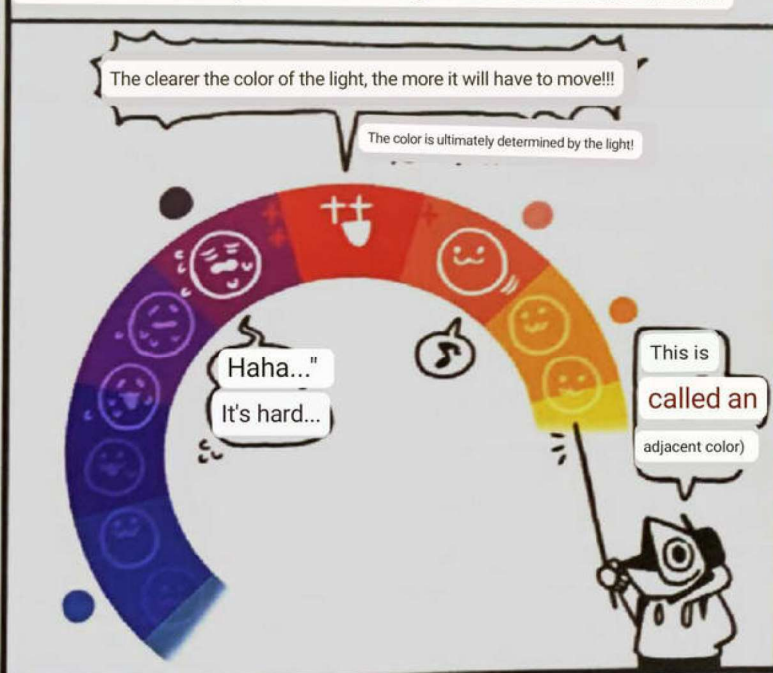
### A color that shows the cycle of Hue.



Because the color of the object color is affected by the color of the light, the color of the object color shifts towards the color of the light source.



The more the color changes, the lower the brightness and saturation of the color.

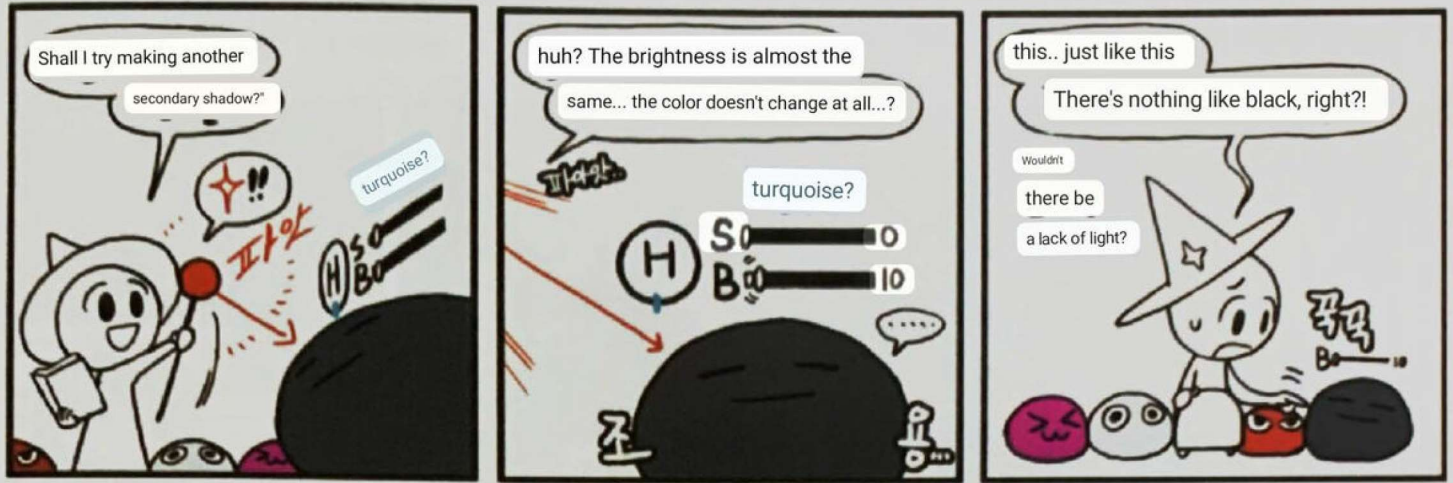


Saturation and brightness change depending on lighting and object color

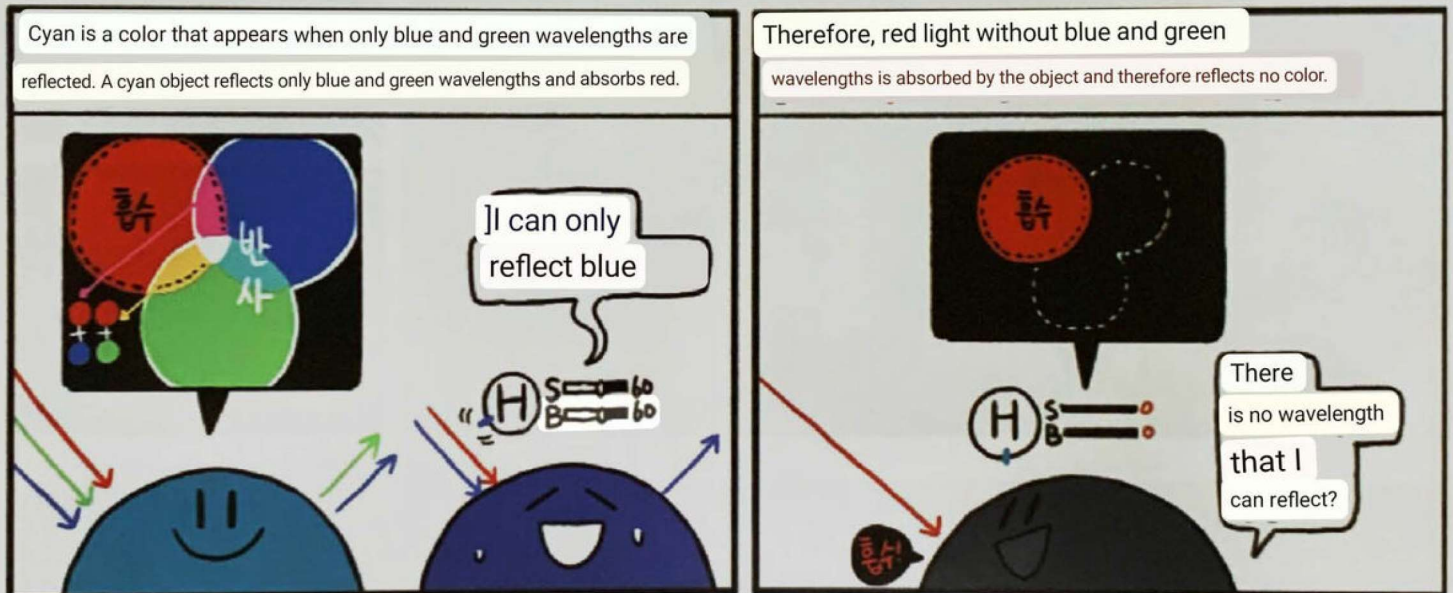
"If only there were light, I think I can make all the colors in the world!!"



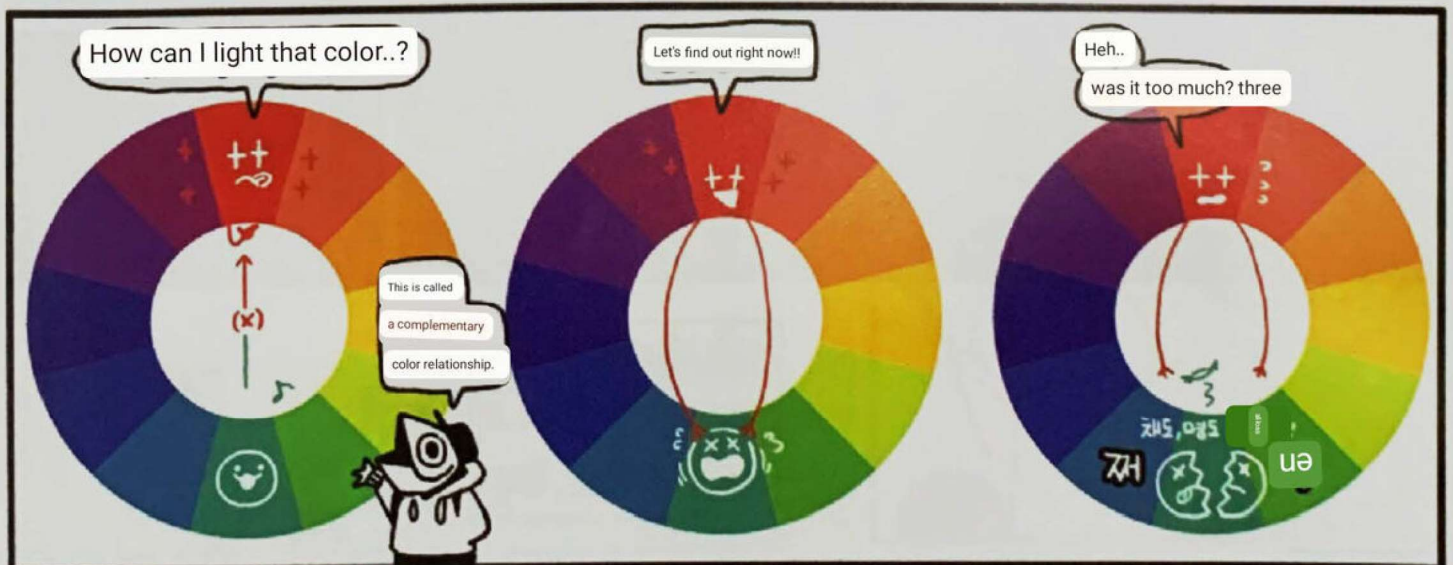




In the process of color appearing on an object, light of a certain wavelength is reflected from the object while the other wavelengths are absorbed. For example, if white light hits a cyan object, the red wavelength is absorbed by the object, and the other wavelengths, blue and green, are reflected, resulting in cyan. So if you shine red light with no blue or green wavelengths, the cyan object will absorb the light and appear very dark.

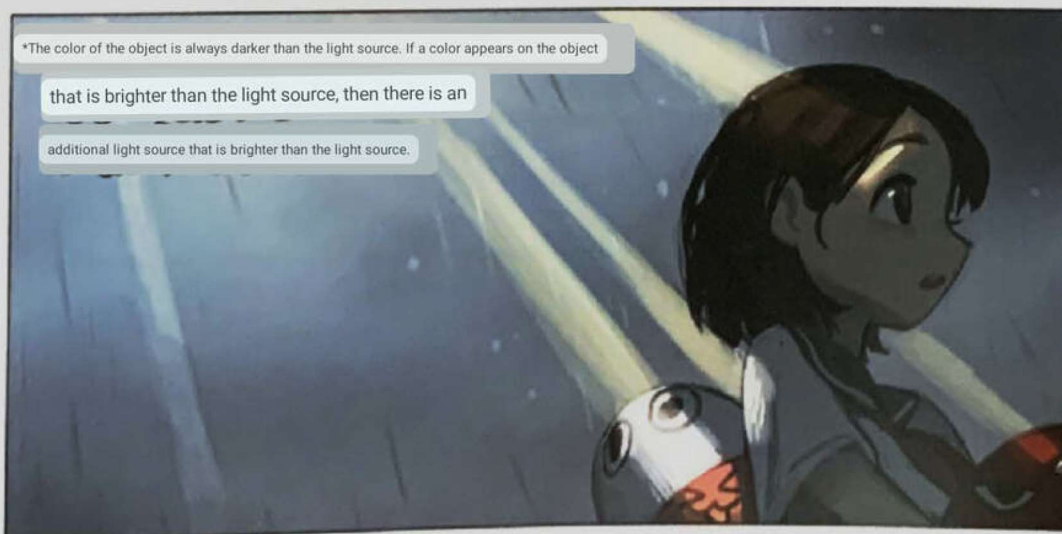
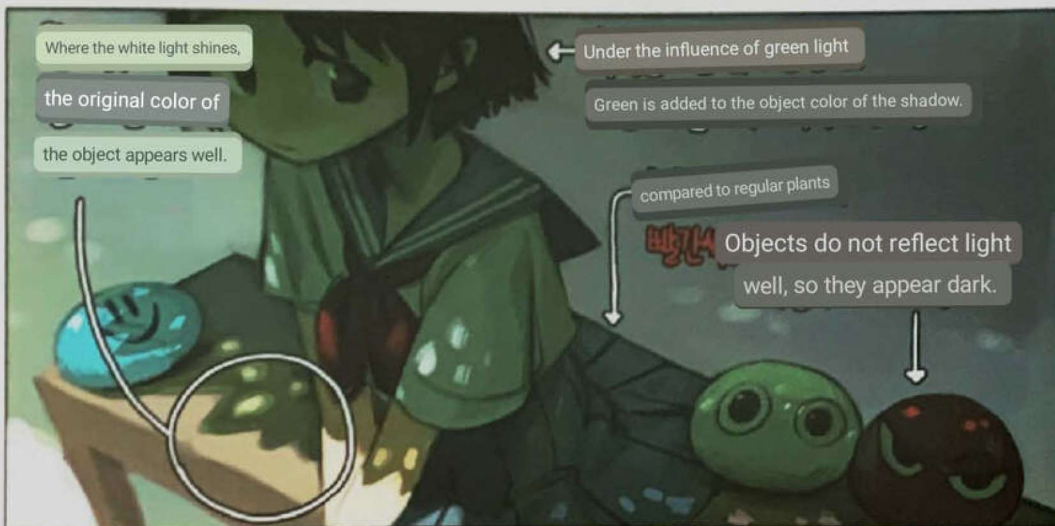


When understood on the color wheel, both the original saturation and brightness of an object are lost in the process of color change.





### 3. Example- Color change of an object by light



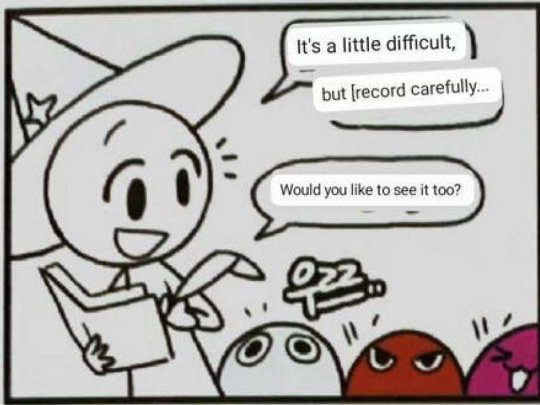
It's basic

As it applies to all principles of light and color

Let's make sure we understand!!

heh...





We also used virtual light that does not exist in nature (light with a specific color wavelength).

There may be a slight difference from the actual color that can be observed.

The answer to the question is at the bottom of the page!



>Fill in the following blanks.

1. Depending on the [light], the light takes on different colors.

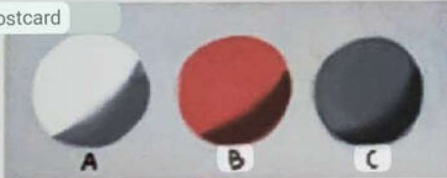
Q2 When the light from the light source is applied to the object, the color of the object appears.

Q3. When an achromatic object receives light, the [ ] of the object rises. Q4. The color of a chromatic object increases as it receives strong light.

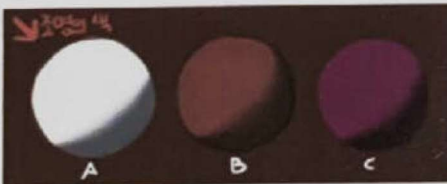
[ ] increases.

>Choose a white object from the following.

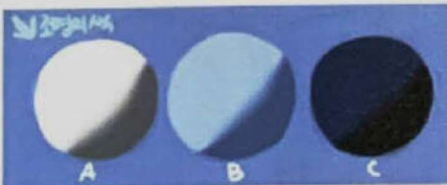
Q5 Postcard



Q6.

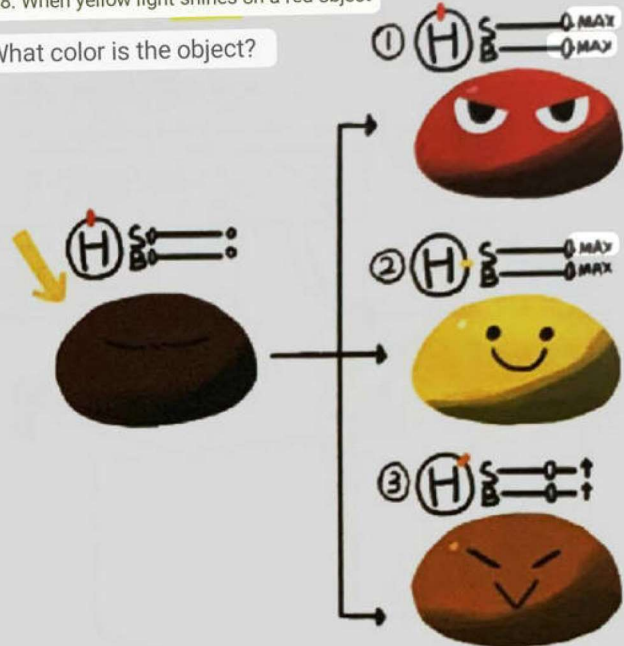


Q7.

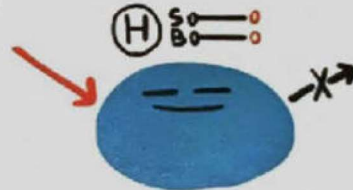


Q8. When yellow light shines on a red object

What color is the object?



Q9. If you shine red light on a cyan object, the color does not change. Why?



① Adding red to cyan makes it darker.

② Because the observer's psychological factors acted ③

Because the object absorbs all the wavelengths and there is no wavelength to reflect

④ Because red is a warm color, it is impossible to reveal a cold color.

Answer Q1) Wavelength Q2) Absorption, reflection Q3) Brightness Q4) Brightness,

saturation Q5) Q6) ⑥ Q7) B

Q8) ③ Q1) ③



Continue next time!

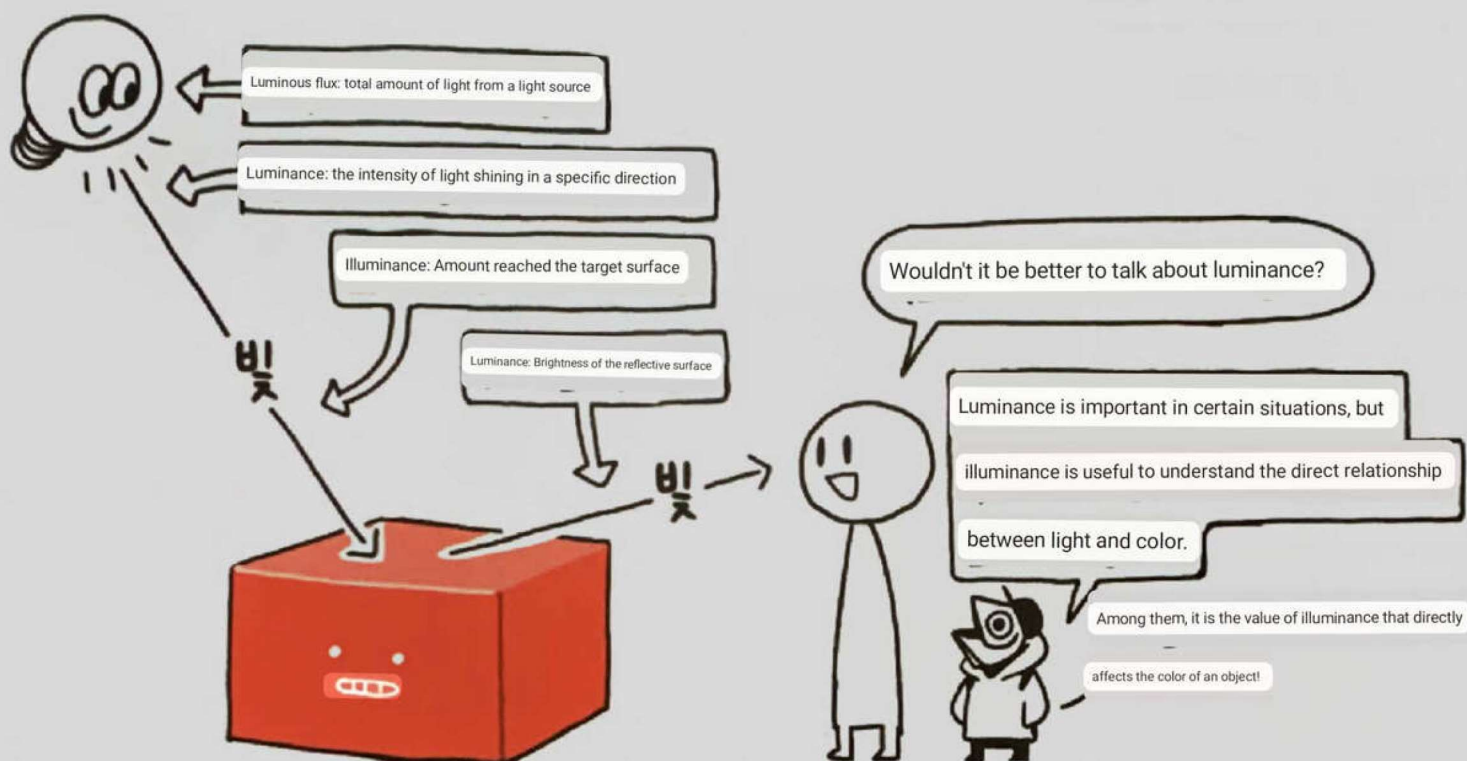


## 2\_ Illuminance

### 1. Luminance, Illuminance, Latitude

How to say light intensity? The intensity of light is called the luminous flux, the intensity of light in a specific direction from the light source is called luminosity, and the value that indicates the intensity of light received by a certain side of an object is called illuminance.

(Unit: Lx) Illuminance is reflected from the object to our eyes. It affects the amount of light (luminance), and the perceived color changes depending on the luminance.



An appropriate amount of illumination is required for an object to have a full color. If the illuminance is low, the color does not appear well, and on the contrary, the intrinsic color of the object does not appear well even if the illuminance is too high.

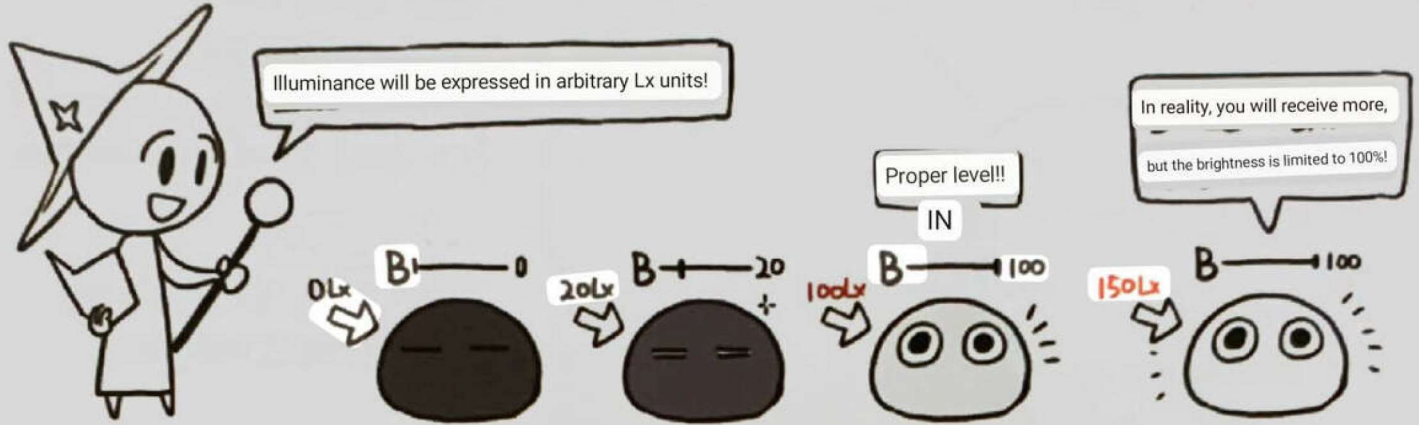


## 2. Effect of Illuminance on Color

Since light is energy, it was found that brightness and saturation increase when light hits an object.

If so, what will happen when the illuminance changes?

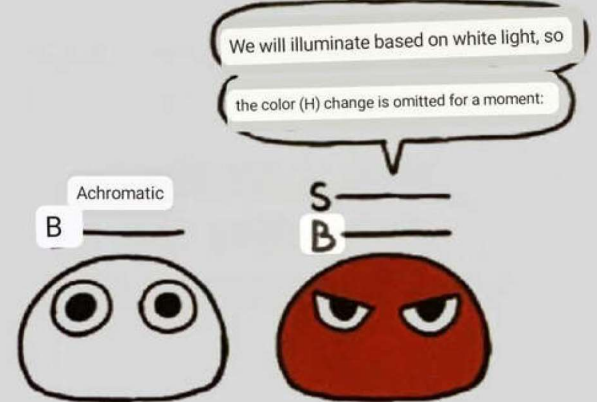
① For any color, the higher the illuminance (additional mixing), the higher the brightness unconditionally."



So, what happens to chromatic colors with hue and saturation? First of

all, it is important to know that saturation is a property

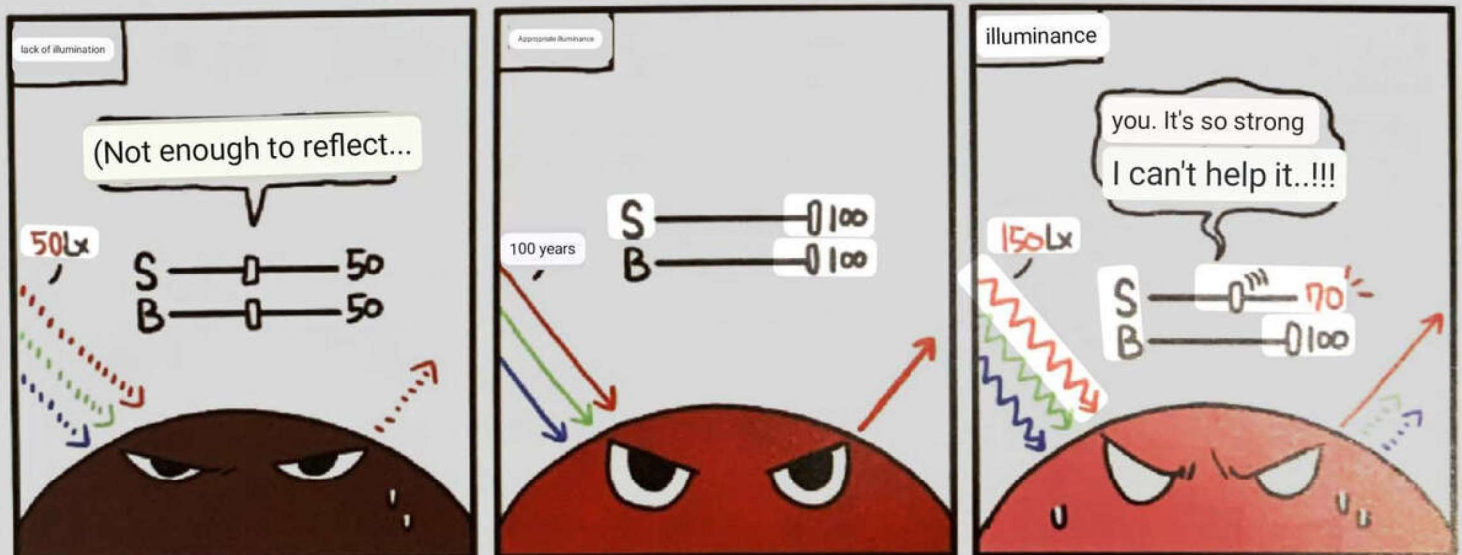
of color. Degree refers to how vividly a color appears in a color.



② If the illuminance is low, enough light is not reflected to our eyes, so the colors do not appear clearly. Also, if the

illuminance is too high, the object does not absorb all the wavelengths it absorbs, but reflects some along with the object color. Therefore,

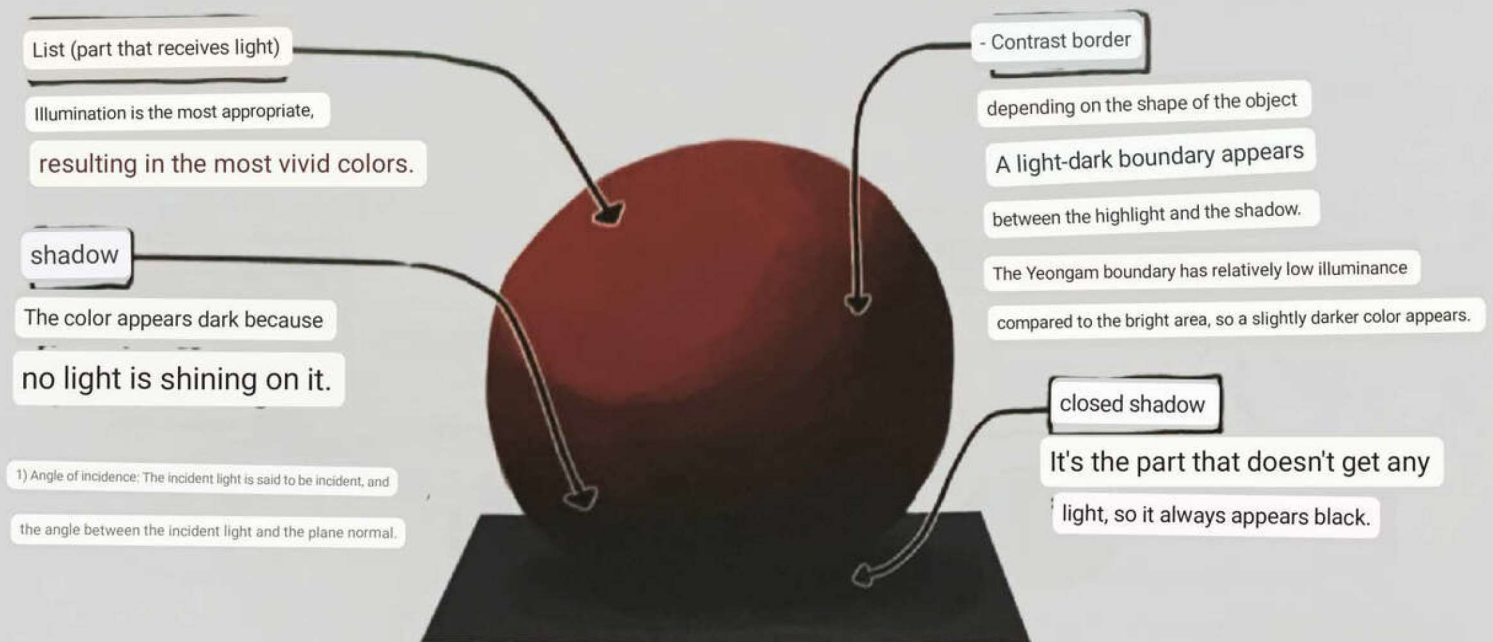
if the illuminance is too high, the object will reflect more light than necessary, and the colors will not appear clearly.



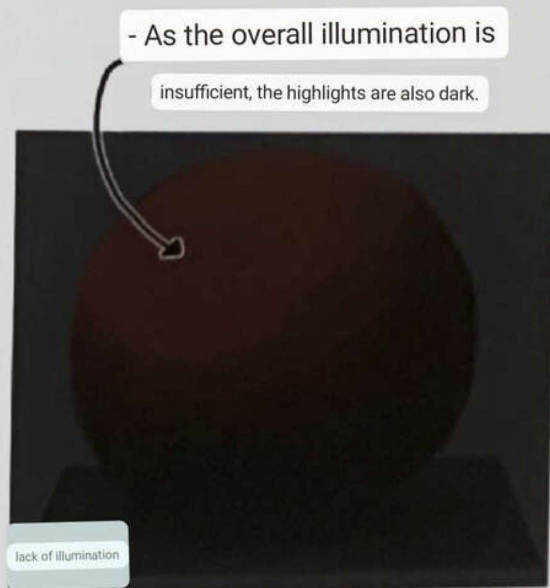


### 3. Illuminance of list and shadow

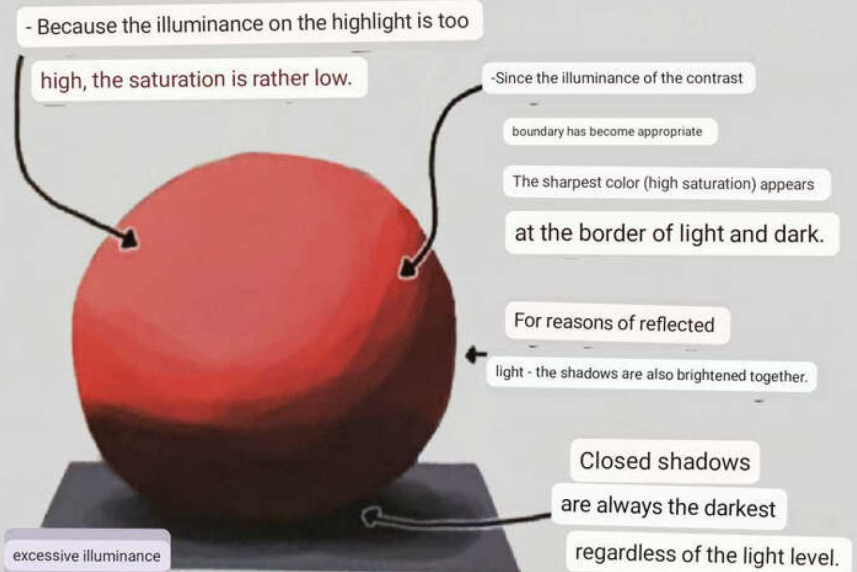
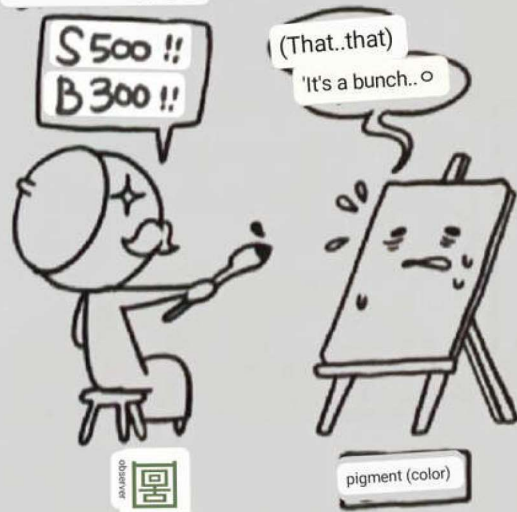
The company's objects have different illuminance depending on the angle of incidence of light, so the colors of highlights and shadows appear different.



At this time, the color of each part changes according to the illuminance.



Draw a dazzling light!



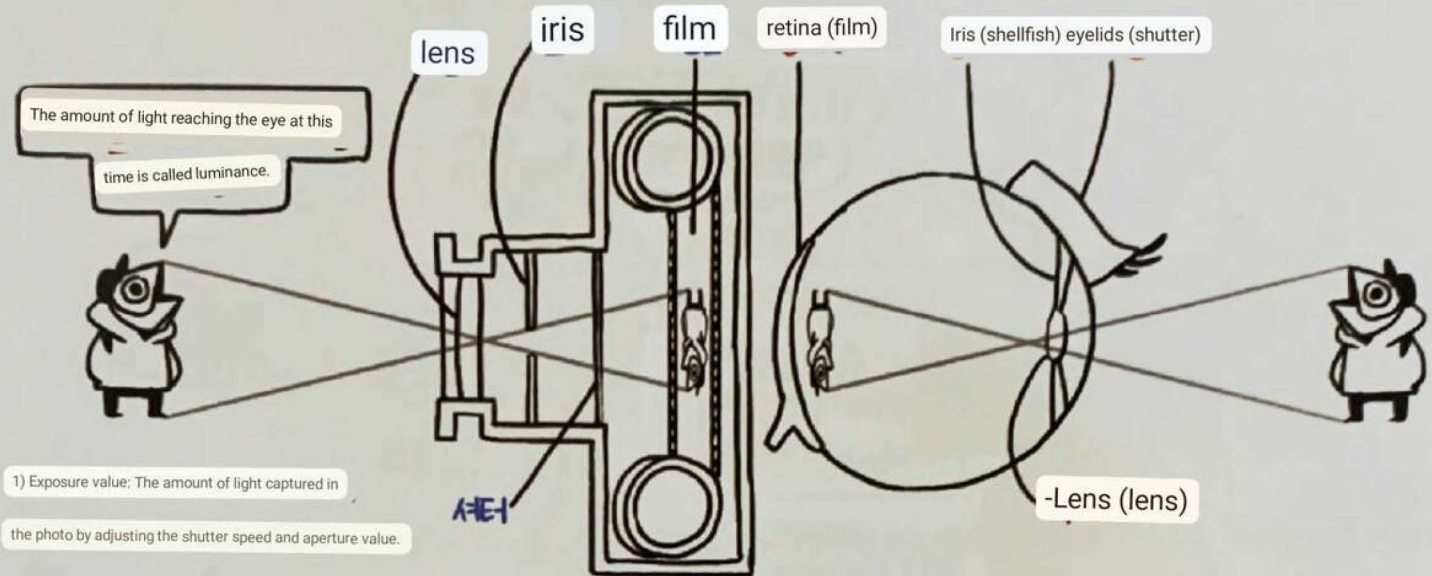
Even if the illuminance is too high to reduce the saturation of the highlights, in reality the highlights may appear brighter and more vivid than the contrast boundary. However, there are limits to the brightness and saturation that can be expressed with pigments. You should actively use the relativity of saturation.

## 4. Camera, exposure and luminance

The eye is said to be the best camera. This is because, independently of the illuminance, the degree of light entering the eye (luminance) is unconsciously controlled.

In order to capture the correct light and color of the world, you need to change the exposure value by adjusting the aperture of the camera.

The human eye automatically processes this and turns it into color, but to recreate an image as a picture, you have to treat it as if you were manipulating a camera.



Just like adjusting the aperture of a camera, you can adjust the illuminance and luminance according to which part of the object you want to capture.

The person looks good in the

photo, but the background is too bright, so it's hard to see.



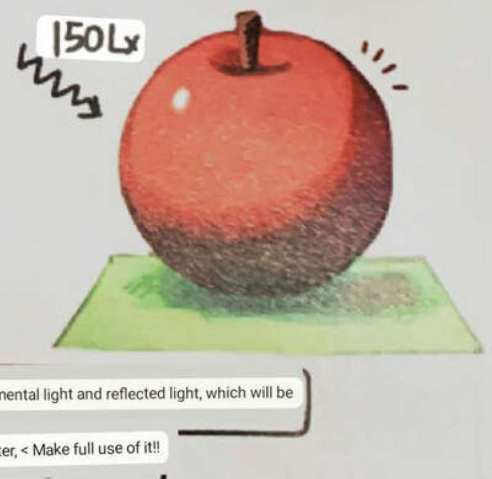
If you can't change the illuminance,

let's lower the luminance

by adjusting the aperture!



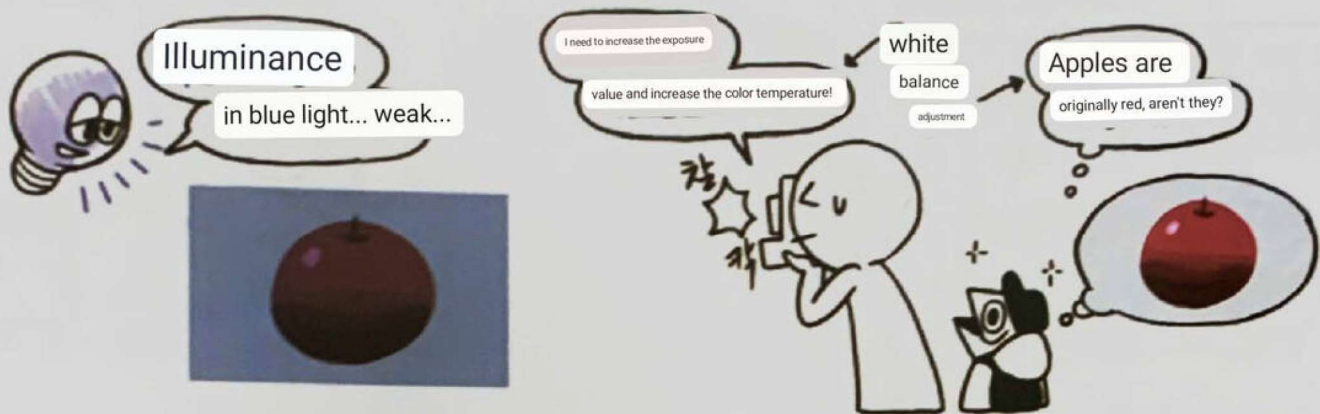
Conversely, when you want to express strong light, you can control the atmosphere by adjusting the illuminance and luminance.



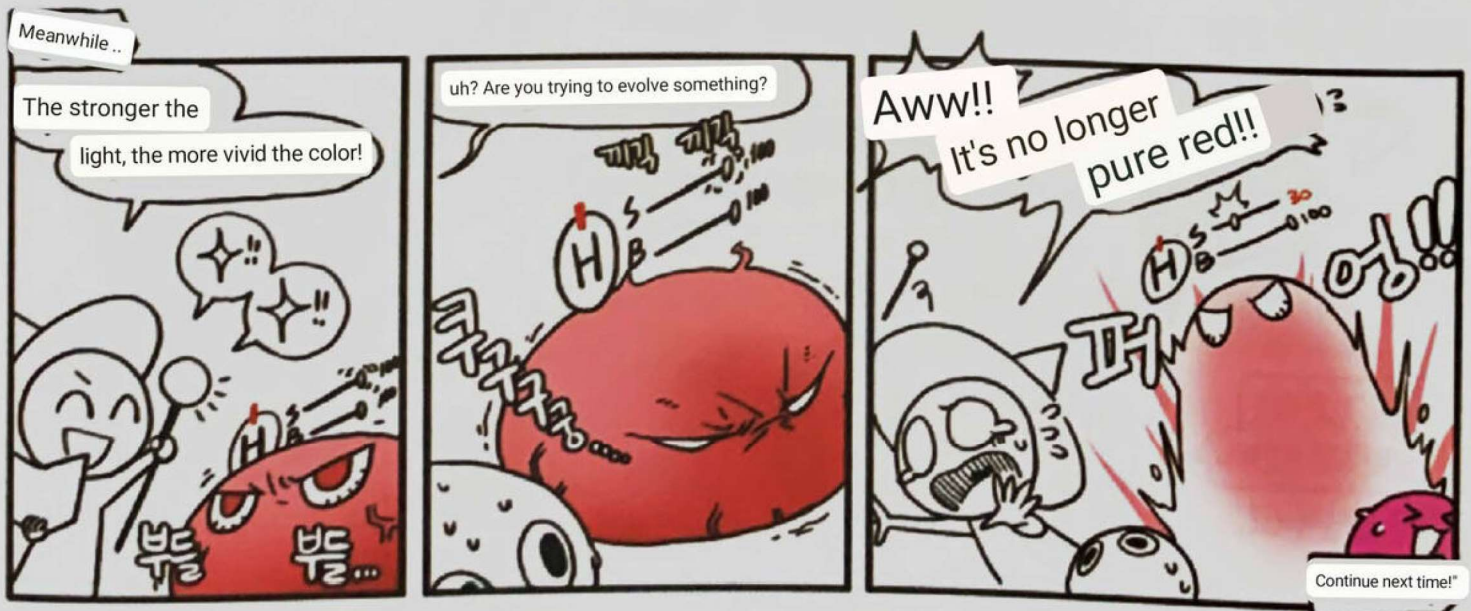
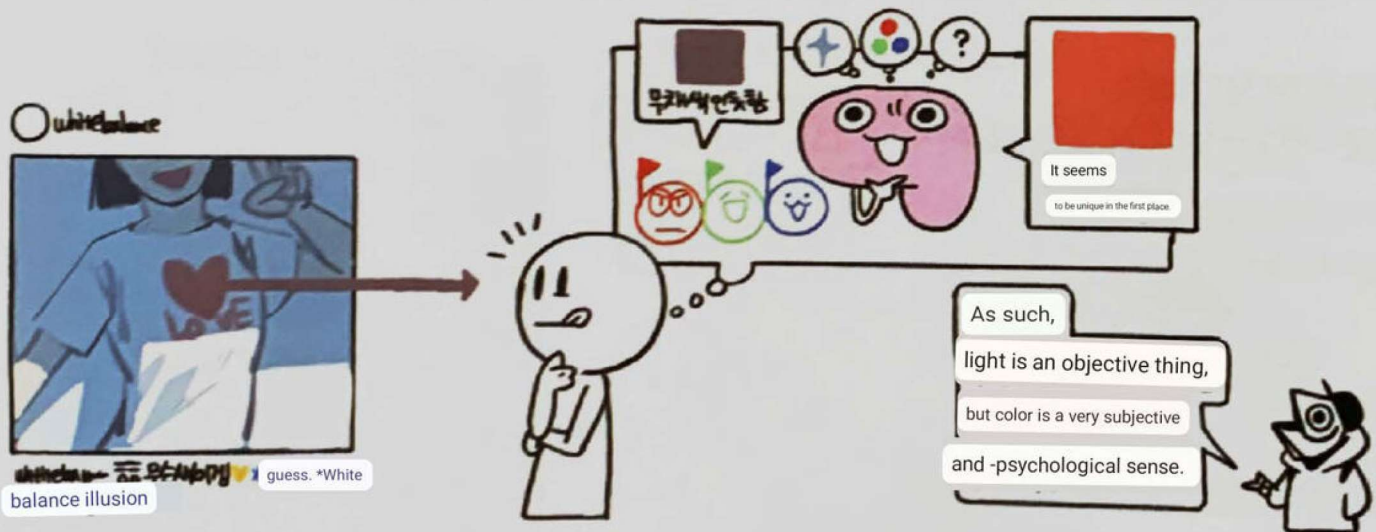


## 5. White Balance

Perfectly white light is very rare in nature, and even rarer to illuminate an object with adequate illuminance. Therefore, most of the colors of objects we can observe are slightly different from the original colors. In photography, correcting the color of an object that has changed according to lighting is called white balance correction. In photos, the white balance is adjusted to find the original color of the object, but the brain automatically corrects the color through memory contrast.



If the light shining on an object or space is well applied and expressed as a whole, even if the exact color of the object is not transmitted to the brain, the brain compares the surrounding color with the color of the object's surface and perceives this information as a subjective sense, that is, a true color.







Let's clean it up!"

If the unique color of  
the object appears clearly on the bright  
spot, it can be considered that the illuminance of the light is appropriate.

If the illuminance is not  
appropriate, vivid colors will not appear on the highlights.

However,

when expressing light in a picture,

1 proper illuminance

and the correct color  
of the object are [not essential!]

Even if the illuminance is

inadequate, the brain corrects the white balance

and recognizes the color of the object --



(excessive illumination)

(lack of illumination)



original color

[However, let's observe and  
understand how the color of  
the same object appears  
depending on various conditions.



It's fine

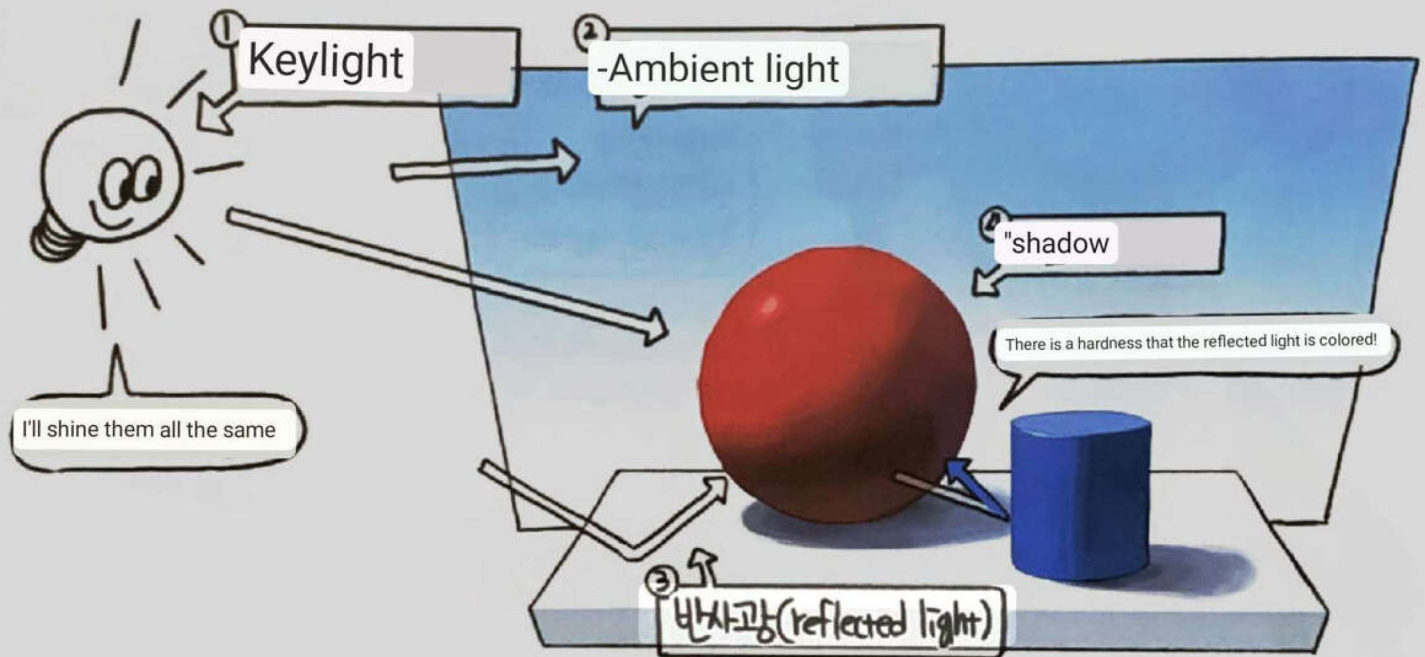




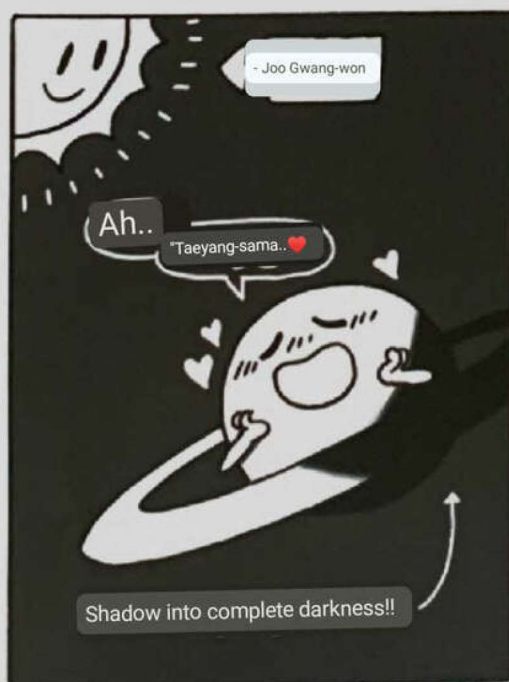
### 3\_Main light source, indirect light, and shadow

#### 1. What is indirect light?

When light strikes multiple objects, each object reflects a specific light from the light source, causing it to be perceived as a color. All colors and objects we can see with our eyes reflect some light, and this reflected light sometimes strikes a significant amount of light on an adjacent object. In this way, the light that illuminates an object indirectly rather than directly from the key light is called indirect light.



#### ① Key light



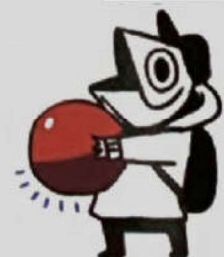
In outer space, shadows appear black because there is no light source other than the main light source.



Indirect light does not appear well when the illuminance of the main light source is low.

A light source that shines light directly on an object. In environments where only the main light is present, the shadows appear as complete darkness. In other words, unless the shadow is complete darkness, something other than the main light source is illuminating the object.

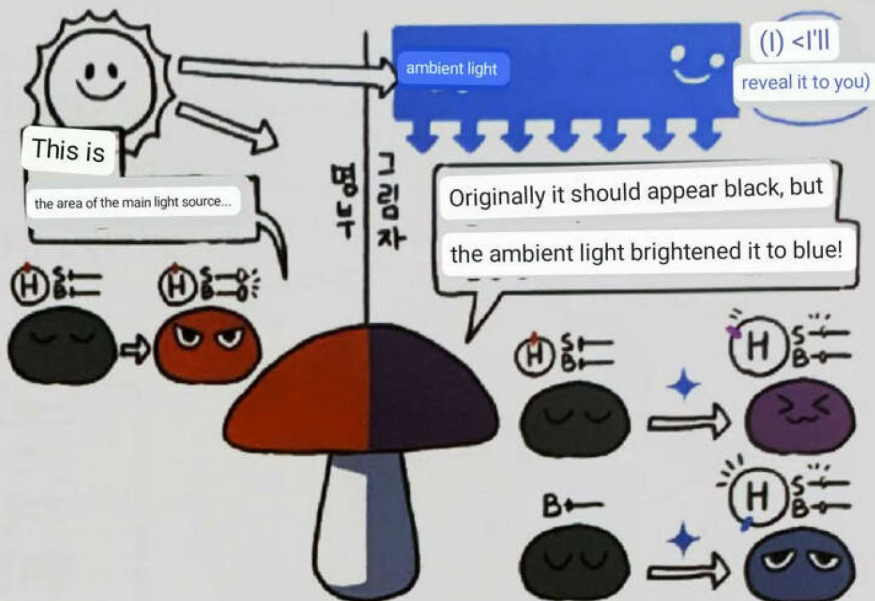
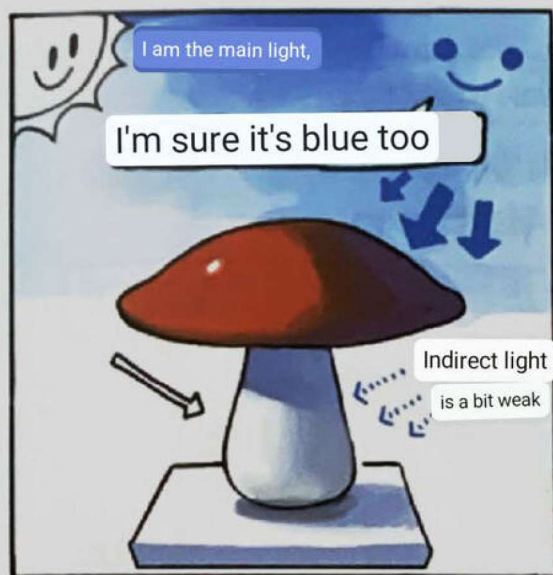
Where the hell are you lighting it?! I can't see the V light source!!



## ② Ambient light

Environmental light (or ambient light) refers to light that is not incident directly from the main light source and illuminates an object from a very wide direction as if the

light from the main light source is reflected from the environment or space and surrounds the surroundings. A typical example is the blue sky that has been brightened by the sun.



Since ambient light is a kind of reflected light, it is relatively weaker than the illuminance of the

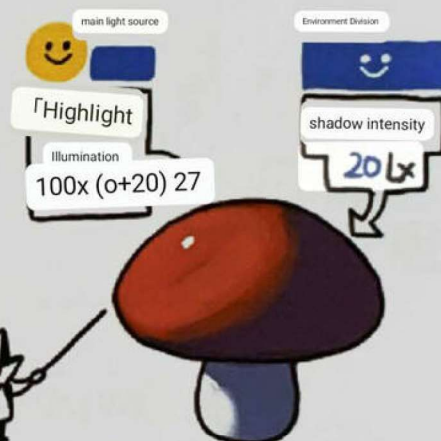
main light source. The bright area that received light from the main light source is affected by the ambient light,

but it is difficult to clearly show the color of the ambient light itself because

the light is added. The ambient light thus serves to illuminate the shadows created by the main light source as a whole.

It is not necessary to add the color of the ambient light to the list. It

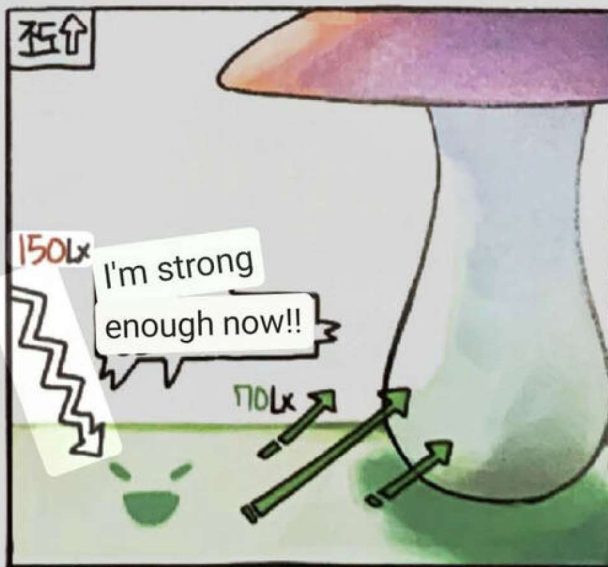
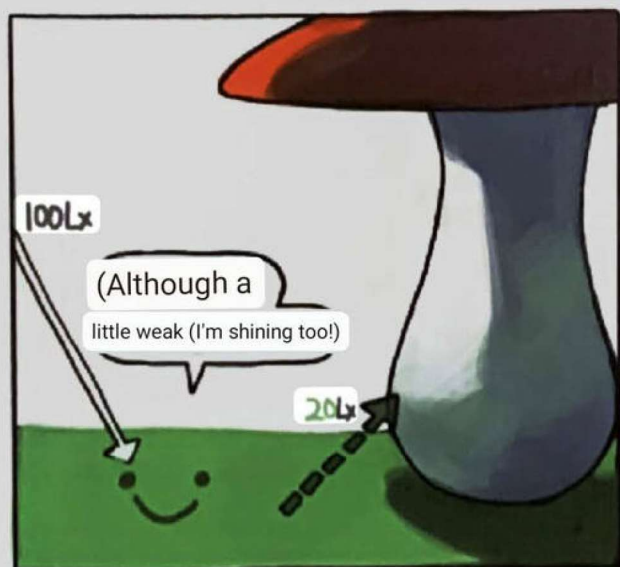
is already added illuminance.



## ③ 반사광(Reflected light)

The light reflected from an object can be perceived as a color, and at the same time, it reflects the light of that color to the surroundings. •Reflected light is

necessarily weaker than the main light source, but it can become a significant light source depending on the illuminance of the main light source and the material or distance of an adjacent object.



Indirect light can be anywhere.



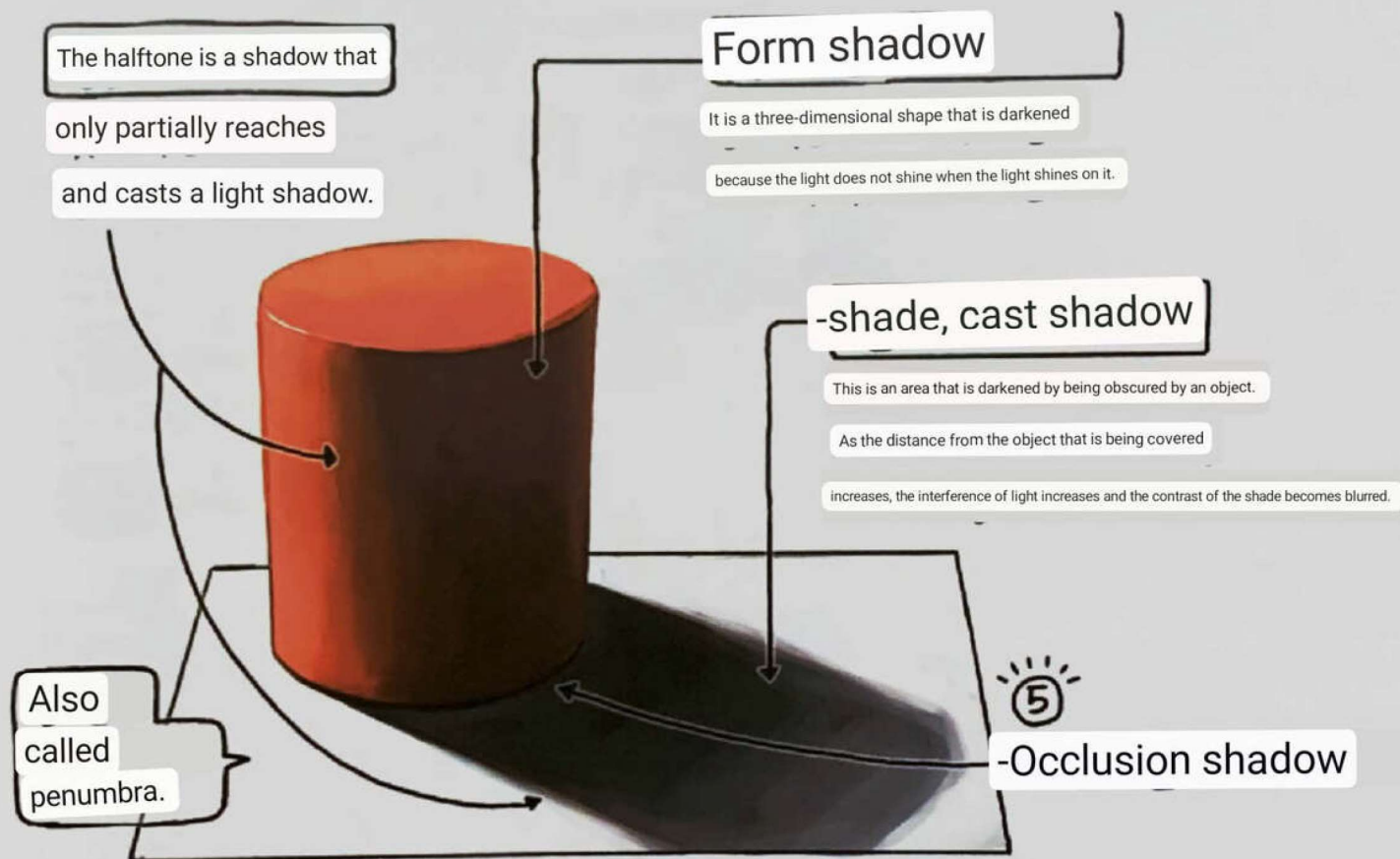


## ④ Types of shadows

The area where the light does not reach from the light source and appears as a relatively dark color compared to the highlight

is called the shadow. Indirect light is more visible in shadows, as it can affect areas of shadows that the main light cannot. Let's learn the

types and names of various shadows that show three-dimensionality, and learn the characteristics of shadows.

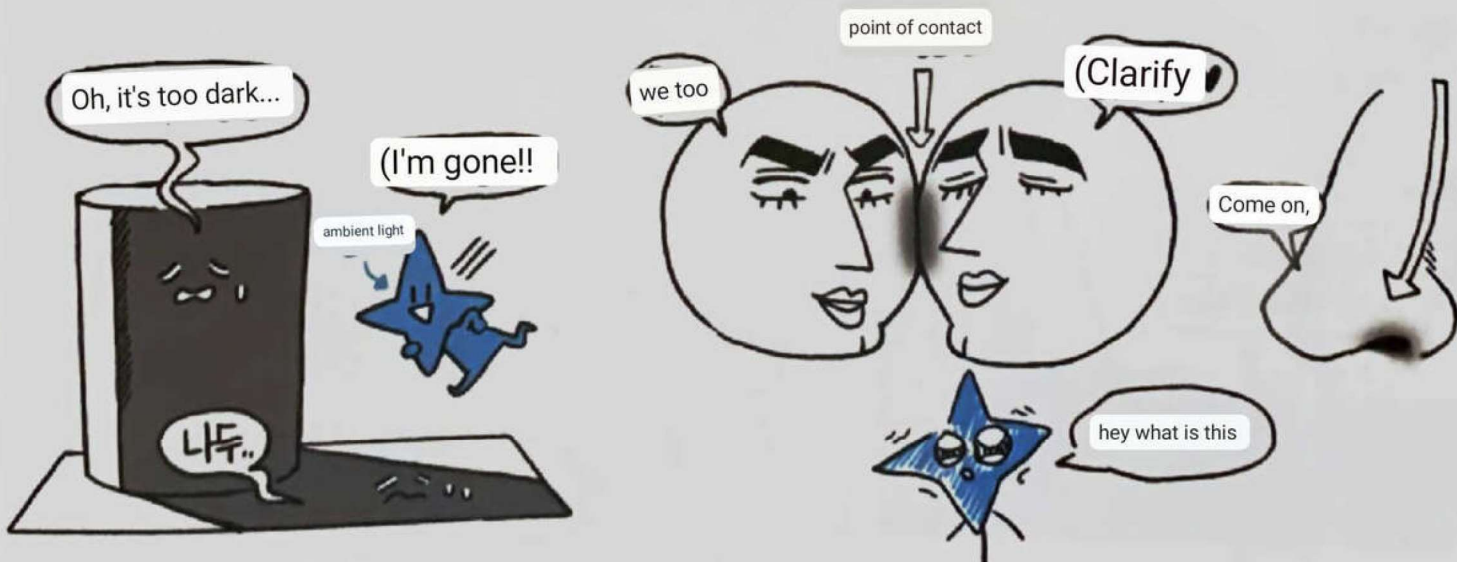


## ⑤ Occlusion Shadow

Indirect lighting brightens the overall shadow of an object, but there are places where even indirect

lighting cannot. The light does not reach both the main light source and the indirect light, such as a tangent or a hole, which is not a

shadow such as a shadow. A shadow that is not affected by illuminance and light direction is called an occlusion shadow.



## Using closed shadows in shadow expression

A technique called AC (ambient occlusion) map is used when realizing light attenuation due to light shielding in 3D renders, etc. Using AC Map,

you can express a natural and realistic feeling by making the shadows cast between objects and in corners darker. It is difficult to fully utilize

the AO map in coloring work, but it is possible to depict more natural shapes and structures by blackening the areas with closed

shadows and setting the illuminance and light direction.







## ► Why is the sky blue?

On a clear day, the sky is lit with blue light. Why is the sky, which is indirect light, blue when the sun, the main light source, is white? In order to understand why the sky is blue, it is necessary to first understand the phenomenon of light scattering, among them Rayleigh scattering. Electromagnetic waves, including light, have wave properties, and are classified into short wavelengths and long wavelengths according to the length of the wavelength.

[Short wavelength: energy is high and is scattered first.]

Just go~



Long wavelength: The energy is weak, but it can reach far.

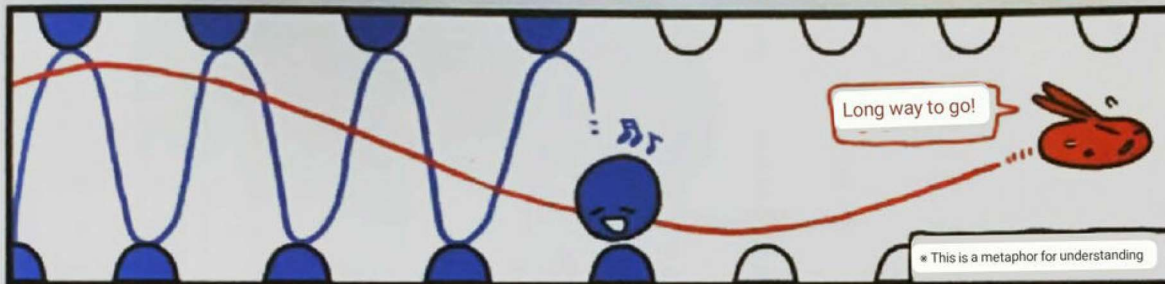


Hurry Hurry!

ultraviolet ray

visible light area

infrared ray



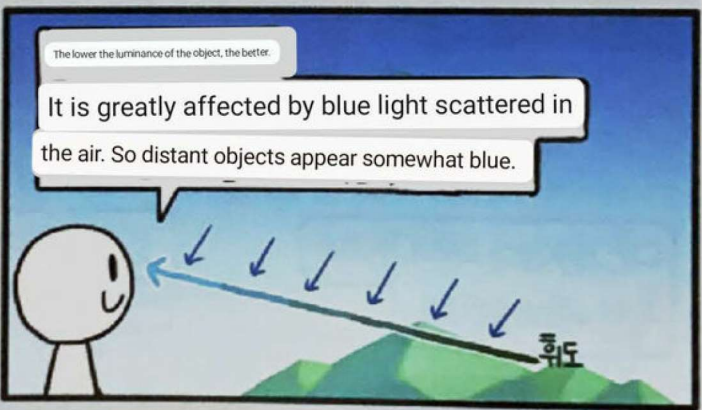
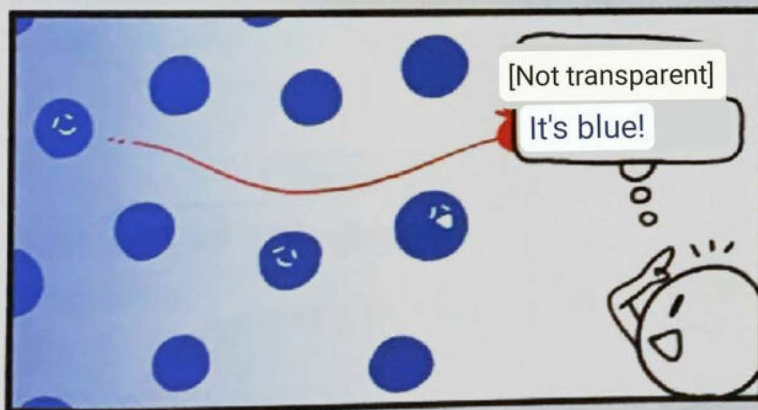
\* This is a metaphor for understanding

In the vacuum of space, scattering does not occur, so there is no color. V

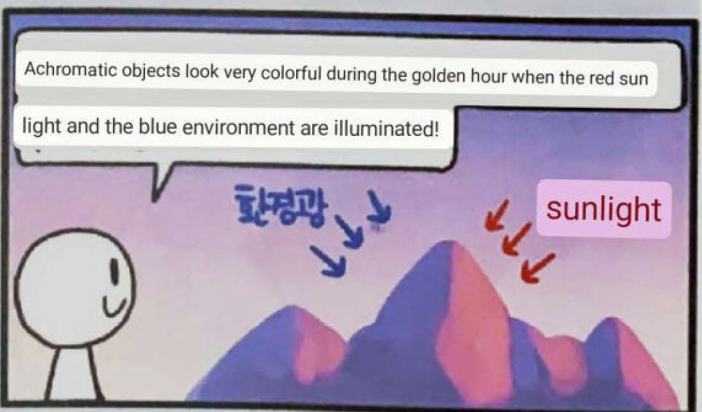
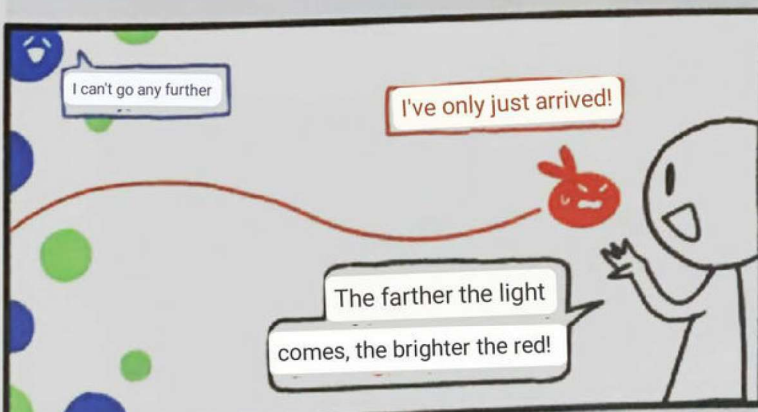


When white light from the sun reaches the atmosphere, short wavelengths of blue light are first scattered by particles in the air.

Therefore, when light passes through the transparent atmosphere, short blue wavelengths are gradually scattered and the sky becomes blue.



At sunset time, the sun's light must pass through a thicker atmosphere, causing more scattering. Short wavelengths are scattered first and disappear, leaving only long wavelengths, and the light of the setting sun reaching the eyes produces a vivid red color.



1) Leylaic acid: When electromagnetic waves pass through a gas, transparent liquid, or solid, they are elastically scattered by small particles.



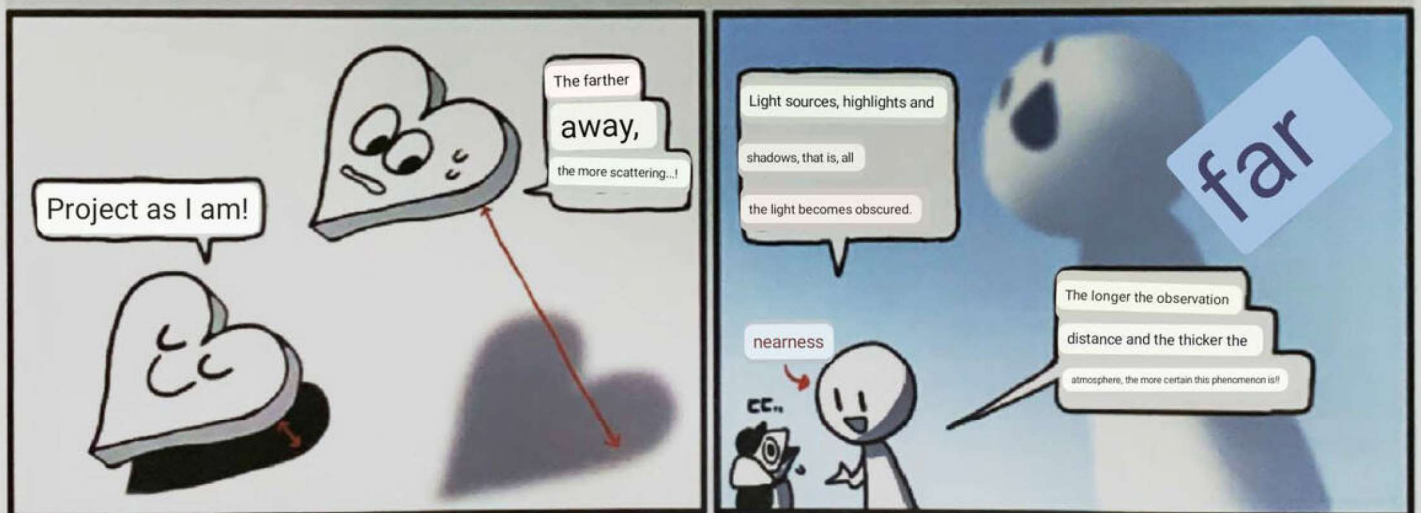
# TMI ▶ Why does the shadow cast from a distance look blurry?

When the wavelength passes through the particle, if the particle is equal to or greater than the wavelength, when the light passes through the dust, the dust scatters all the light. Electromagnetic waves, including light, have wave properties, and are classified into short wavelengths and long wavelengths according to the length of the wavelength.

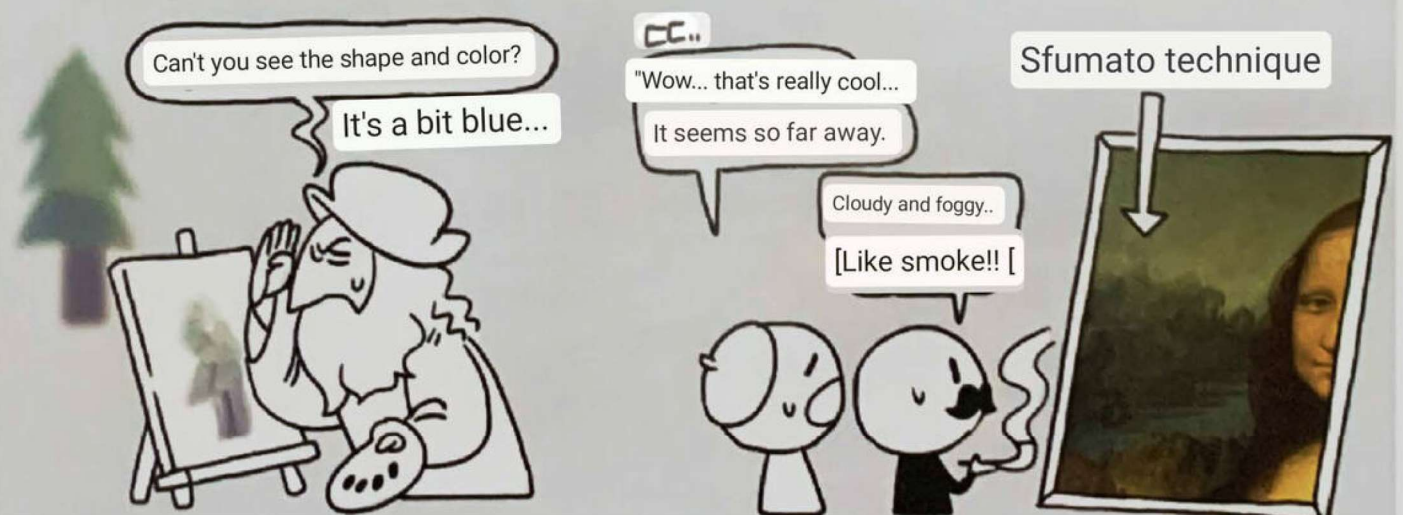


The more particles such as dust or moisture in the air, the more scattered light interferes with other wavelengths.

Objects may be perceived as having different colors depending on the condition of the atmosphere surrounding the object or the distance between the object and the observer.



Leonardo da Vinci applied the sfumato technique, which blurs the color and shape of an image, to his paintings.



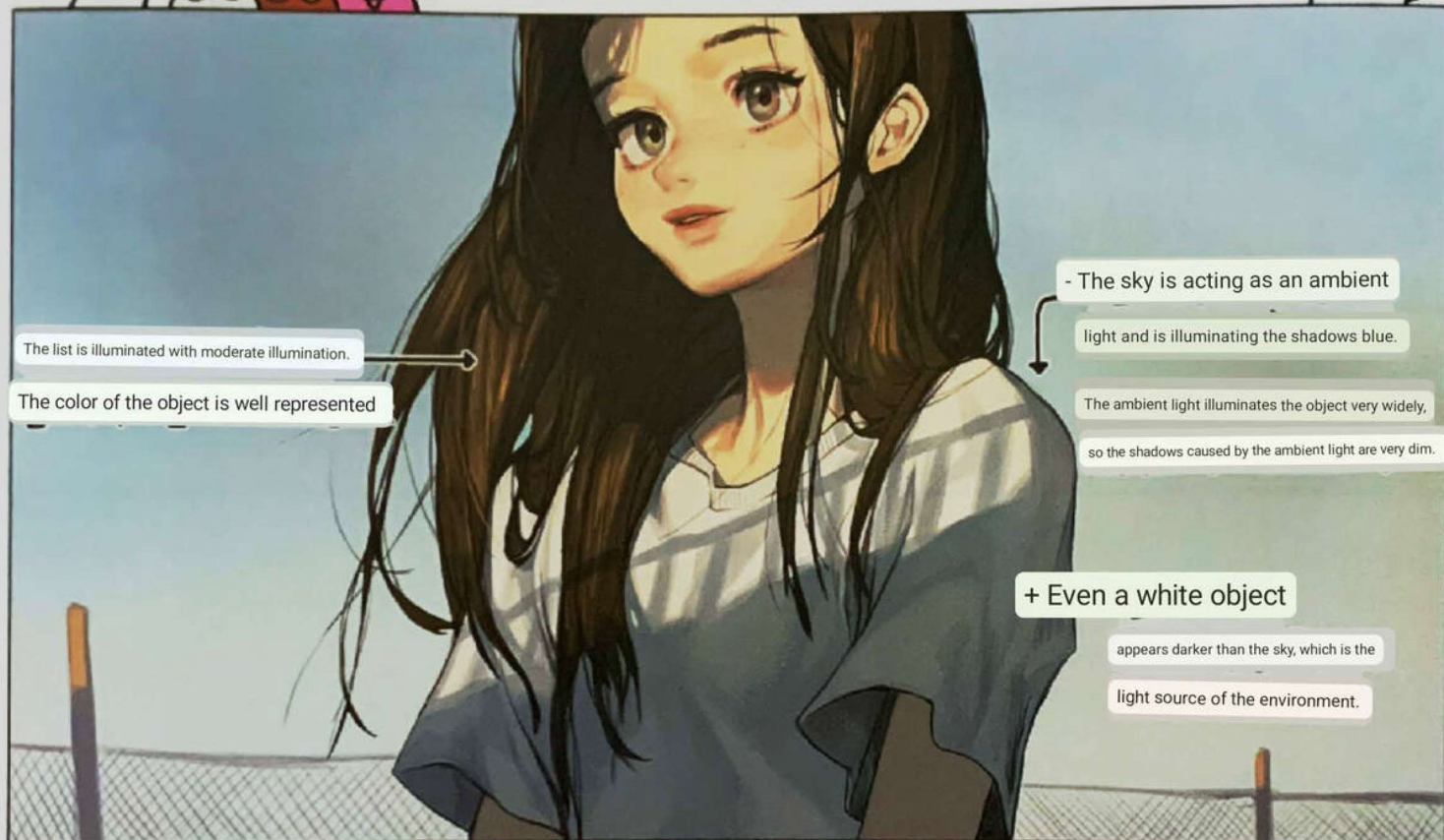
2) Atmospheric Perspective: An expression of the sense of distance by reproducing the phenomenon in which distant objects become blurred according to the density of air.





Let's look at an example of indirect light  
and summarize it once more!

You can observe the difference  
in illuminance 1 learned earlier.



The list is illuminated with moderate illumination.

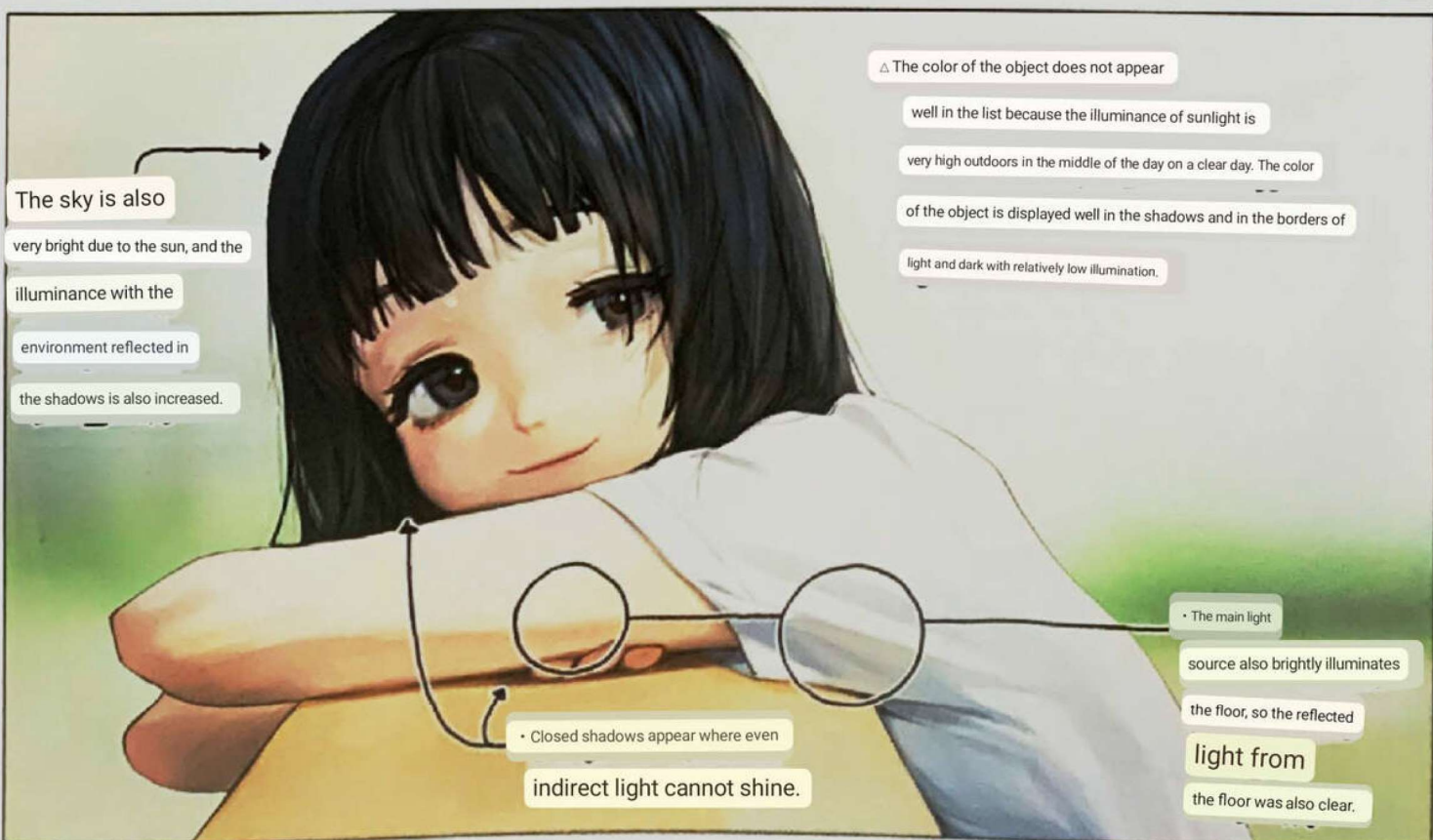
The color of the object is well represented

- The sky is acting as an ambient  
light and is illuminating the shadows blue.

The ambient light illuminates the object very widely,  
so the shadows caused by the ambient light are very dim.

+ Even a white object

appears darker than the sky, which is the  
light source of the environment.



The sky is also

very bright due to the sun, and the  
illuminance with the  
environment reflected in  
the shadows is also increased.

△ The color of the object does not appear

well in the list because the illuminance of sunlight is  
very high outdoors in the middle of the day on a clear day. The color  
of the object is displayed well in the shadows and in the borders of  
light and dark with relatively low illumination.

• Closed shadows appear where even  
indirect light cannot shine.

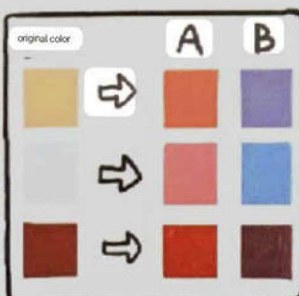
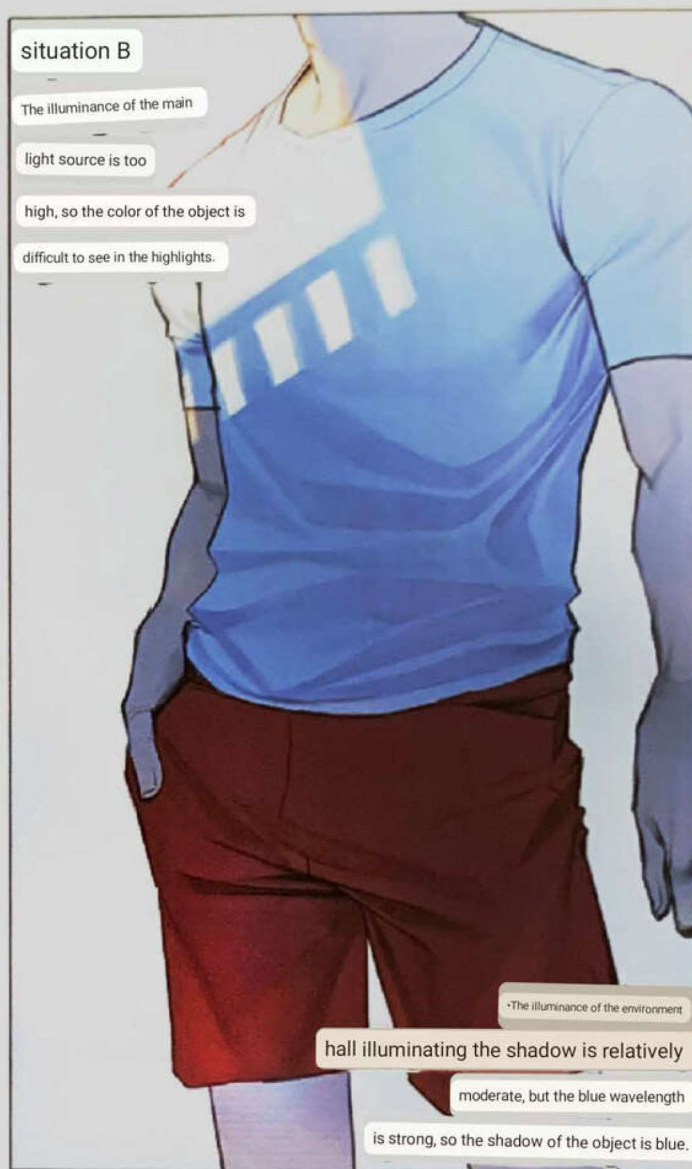
• The main light  
source also brightly illuminates  
the floor, so the reflected  
light from  
the floor was also clear.



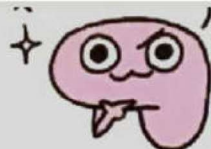


- Observe that objects of the same color appear as distinctly different colors by the light source.

Observation is paramount



You can't fool me later!



- Even if the color of an object appears different due to light

The brain automatically corrects it and recognizes it as the original color. The

color correction of the brain is greatly affected by the color of the surrounding

environment, so for natural coloring, the expression of light must be properly painted over the entire picture.

I need a hint for color correction!!





## Practicing Passing Objects to Photos

In the real world, various lights illuminate the world. Let's infer the light from the color of the object, and color the object according to the analyzed light.



Wouldn't it be  
too difficult for a beginner?



Should I observe?



A place simpler  
than you think!

Finding a hint of light

through the color of an object

This is the purpose of practice.

① The light of the main light source



[Red bricks turn orange,

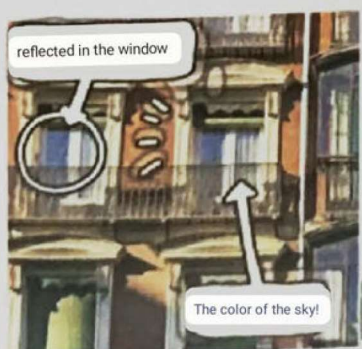


Brighter than the original green color.

The light from the main light source can be inferred by the color of the highlight where the object is directly

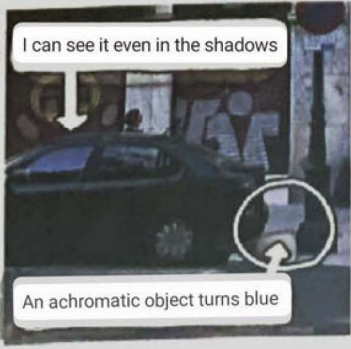
lit. The red bricks appear somewhat orange (color of light), and the green leaves are brighter than their original color (illuminance).

② Light of indirect light



reflected in the window

The color of the sky!



I can see it even in the shadows

An achromatic object turns blue

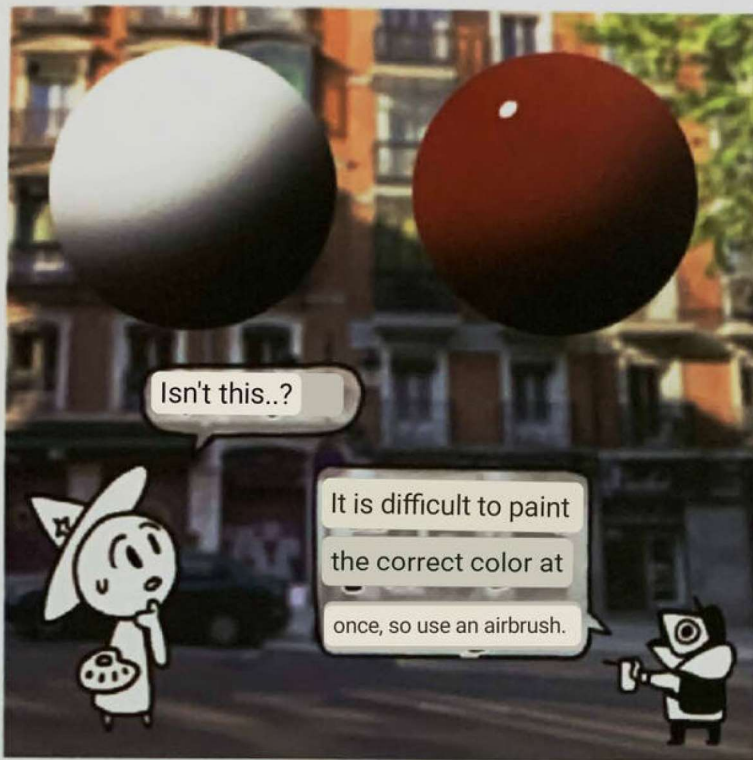
Indirect light, especially ambient light, does not have a clear incident direction.

The color of the overall shadow

or the light reflected off a smooth object is a hint.

In the photo, a blue ambient light is shining.

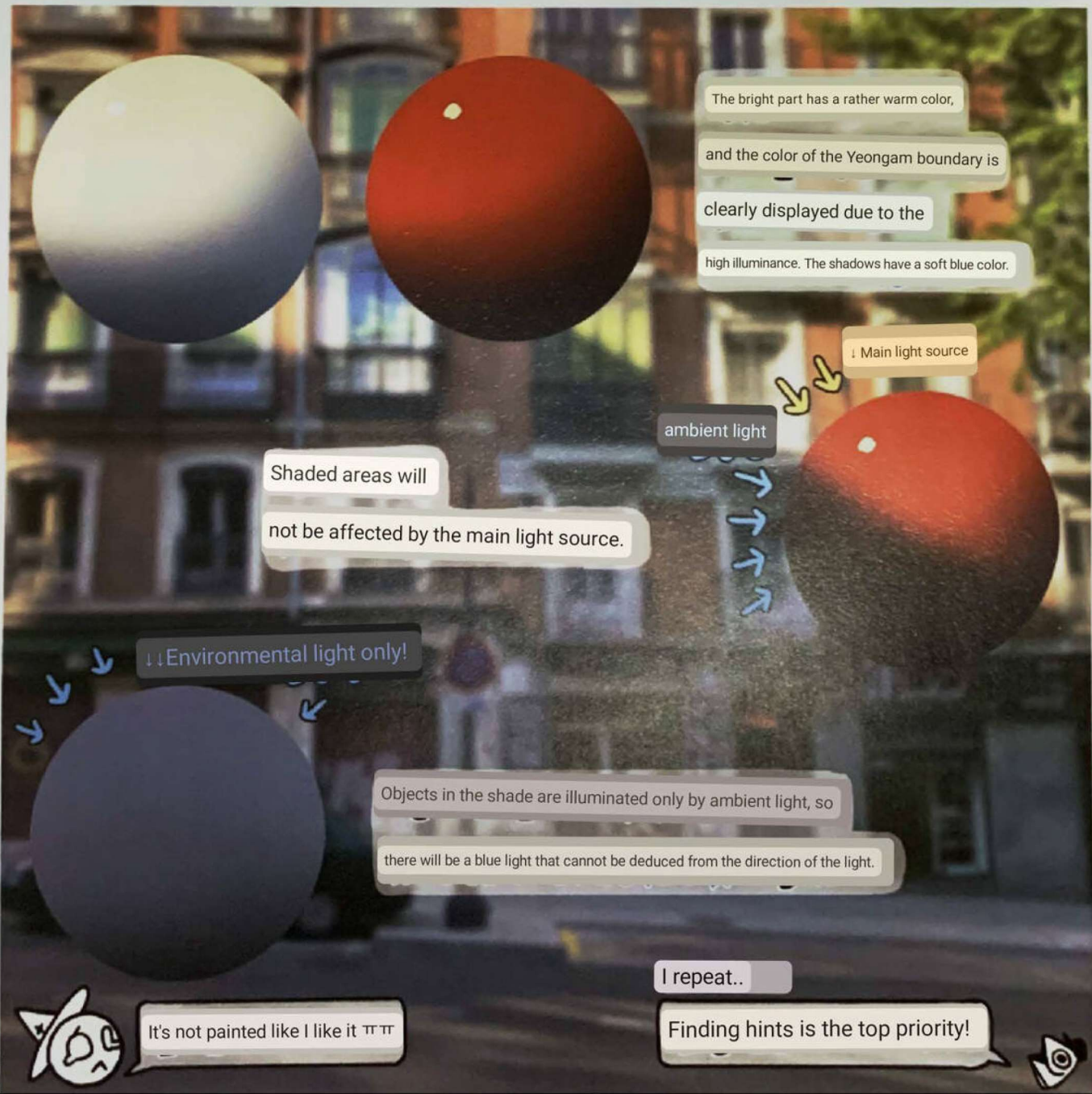




3) Color the indirect light and closed shadow first.



④ Overlay the highlights and contrast borders with the color of the main light source.





## light that shines differently over time

Let's observe the changes in the light of the sun and sky over time

and find out what changes in the color and illuminance of the light.

## day

This is when the sun, the brightest light source in nature, is at its brightest. The illuminance of the main light source is very high, and the indirect light also has vivid colors. The

contrast between the highlights and shadows is very clear, and depending on the direction, a color with higher saturation can be used in the shadows than in the highlights.



## ① color

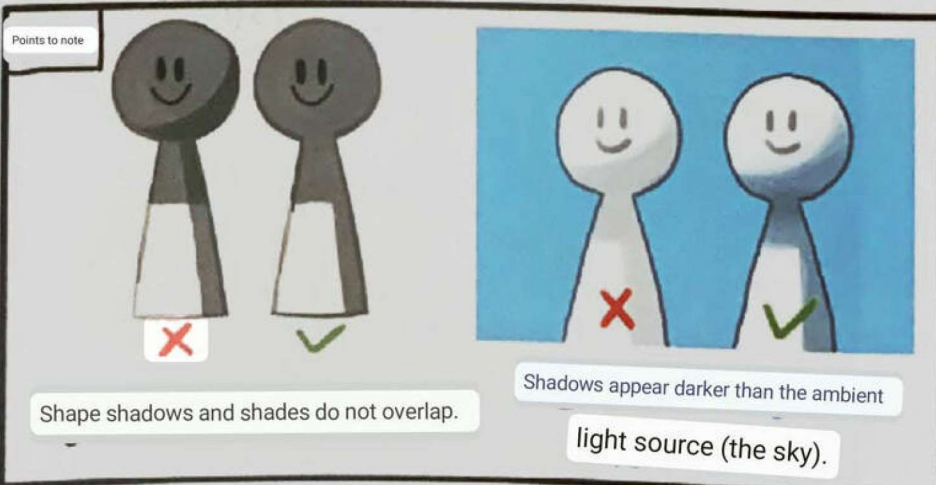
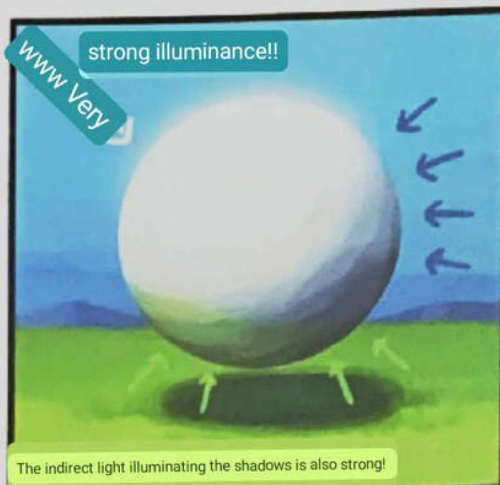
This is the time when the color of lower objects is best. Because the sun is almost white light, there is little change in hue in the highlights. On the other hand, the shadow has a large color change because the blue ambient light is added vividly.

## ② Saturation

Just like adjusting the exposure value on a camera, you can color by desaturating the colors that appear in the highlights and increasing the saturation of the shadows or contrasting borders.

## ③ brightness

The contrast of the shadows created by the main light source is very high, and the three-dimensional effect stands out, and the shadows of the ambient light that cast the shadows have a low contrast.







## Sunset, Sunrise

It is also called golden hour.

At sunset and at sunrise, the sunlight passes through the thick atmosphere and becomes reddish. Under the influence

of the main red light source and the blue environment, the intrinsic color of the object does not appear well, but a very colorful color change can be observed.



### ① color

As the sun's illuminance decreases, only red wavelengths remain. It is a moderate illuminance to brighten the highlights, but the warm colors stand out clearly.

The sky, on the other hand, subtly illuminates the blue ambient light. In highlights and shadows, there is strong contrast as well as clear color contrast.

### ② saturation

The red wavelength incident on the bright spot strongly increases the saturation of all colors except for green-cyan type objects. ③

### Brightness

Compared to the daytime, the illuminance of the main light source is lowered, and the brightness of the highlights is increased appropriately. The main light source is dimmed, so all indirect light is less affected.

skin

dress



skin



Points to note



The contrast between highlights

and shadows can be weakened by paying attention to color differences.

When coloring a chromatic object, the color saturation

is Highlight > Contrast boundary) Shadow.

The afternoon sunlight is enough to illuminate the object,

but the color of the object may change slightly because the warm

color wavelength is stronger than the midday light.

All indirect light is dimmed, so the

shadows are darker than in the middle of the day.

Because the ambient light shining on the shadow has a blue color

The contrast of warm colors and cold colors appears along

with the clear leader of the highlights and shadows.





## twilight (twilight)

When the sun goes down, the strong main light source, the sun light, disappears, and only the wide sky exists as a light source of weak ambient

light. Since the light from nature is very weak, the effect of other artificial lighting is clearly visible on the object.



### ① color

Only the effect of the blue sky affects the object widely, so the blue color appears throughout the object.

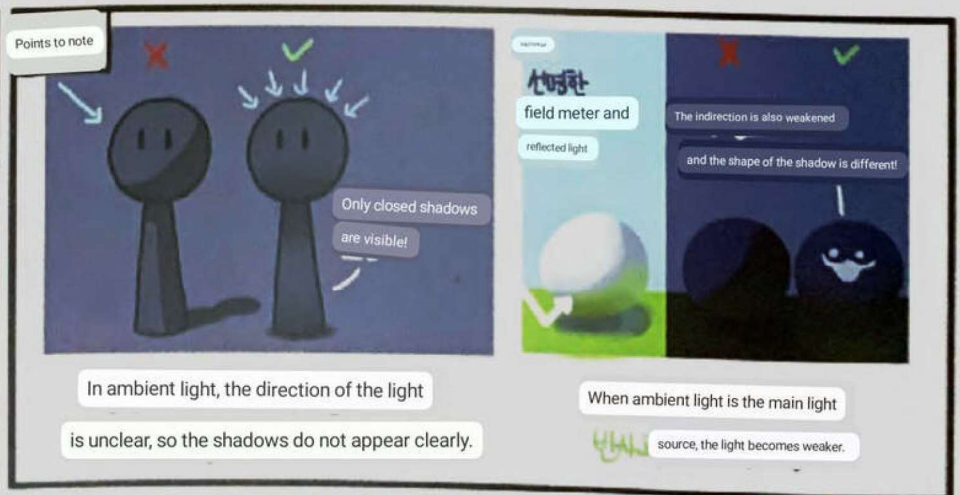
In particular, it can be observed that a clear blue color appears in an achromatic color, especially a white object.


### 2. Saturation

It is desaturated because it is not illuminating enough to evenly illuminate the object. In particular, the yellow color appears very low in saturation. 3)

### Brightness

Except for objects that emit light by themselves and objects illuminated by artificial lighting, all objects appear darker than the sky, which is the light source of ambient light. The light of the sky without the sun lasts only a very short time, so everything goes black in an instant.





Natural light after sunset

The sky becomes the main light

source. Therefore, colors lighter than the sky do not appear.

The illuminance of the sky, which is the ambient light,

is very low, and the direction of the light is

not clear, so the shadows created by

the ambient light are very blurry.

At this time, if there is bright artificial

lighting, the presence is very prominent.



## midnight

The relatively dark moonlight appears at midnight when even the sky is dark. Since the

moonlight is also indirect light reflected from the sun, the illuminance is very low, and starlight cannot be regarded as a meaningful light source.



### 1 colour

Because moonlight is indirect light and the illuminance is very low, only bright colors such as white stand out, while other colors look very dark.

The moonlight itself is white light like the sun, but depending on the direction, it is expressed in blue to show contrast with the warm sunlight.

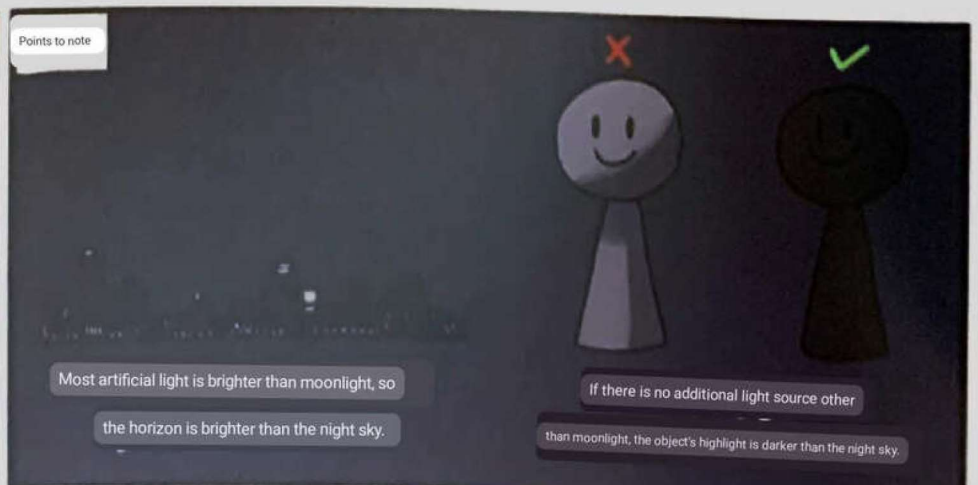
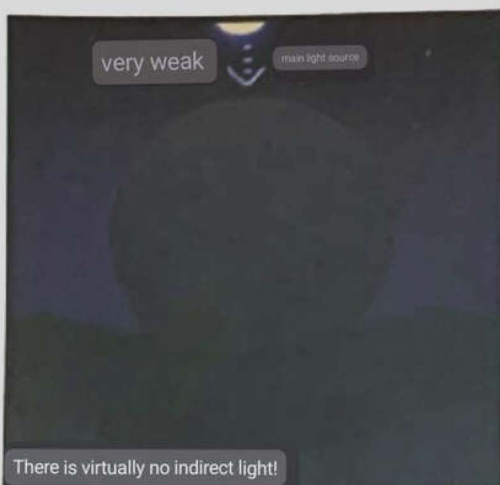
### 2 Saturation


Along with the lightness, the saturation is also very low, and the saturation change of the yellow series is large.

### 3 people

Moonlight is not illuminating enough to illuminate objects. If there is a light source with a stronger illuminance than the moonlight, the color change due to it is clearly

visible. In the absence of artificial lighting, the object should be darker than the night sky.





Starlight is too small and

weak to be used as a valid light source.

The moonlight does not illuminate objects

sufficiently because the light intensity is weak.

•If a color brighter than the night sky appears on an object,

it means that there is a light source other than moonlight.

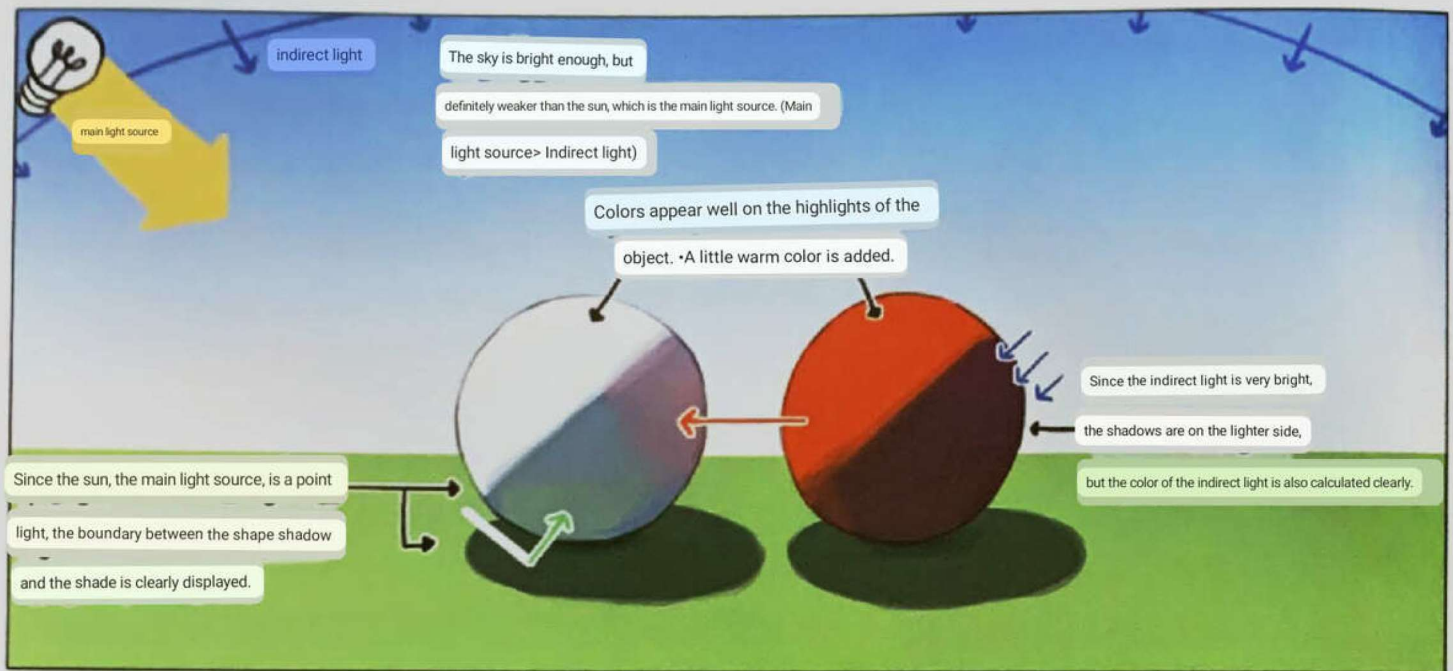
artificial lighting



## Changes in light and color depending on the weather

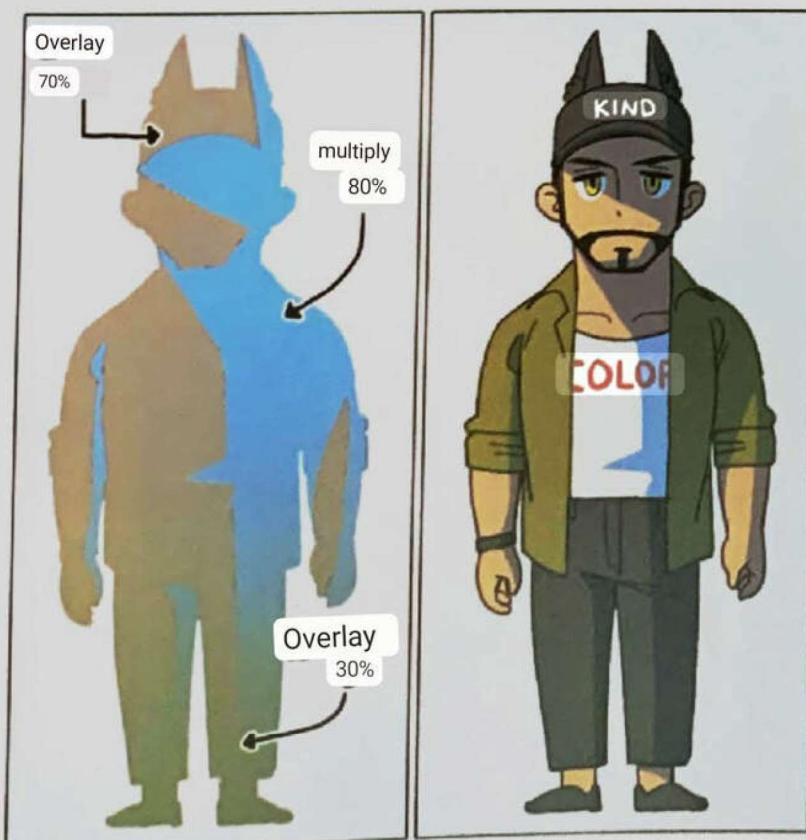
Let's learn the strength and weakness relationship between light sources that change according to the weather and express them easily using the layer composition function.

## Sunny



Lighting in which a small-sized light source illuminates the light in a certain direction

In clear weather, the illuminance, color, and incident method of the main light source and the ambient light are clearly distinguished, so it is used as the most common natural light production. However, because the contrast between the highlights and shadows is very clear, the detailed description of objects is often omitted. Colors and contrasts created by different types of light are the subjects, so you can express various colors throughout the object.



## simple synthesis

Draws sharp boundaries between highlights and shadows.

Add a little warm color while increasing the saturation

by overlaying light gray brown on the highlights,

and multiplying the shadows by multiplying the

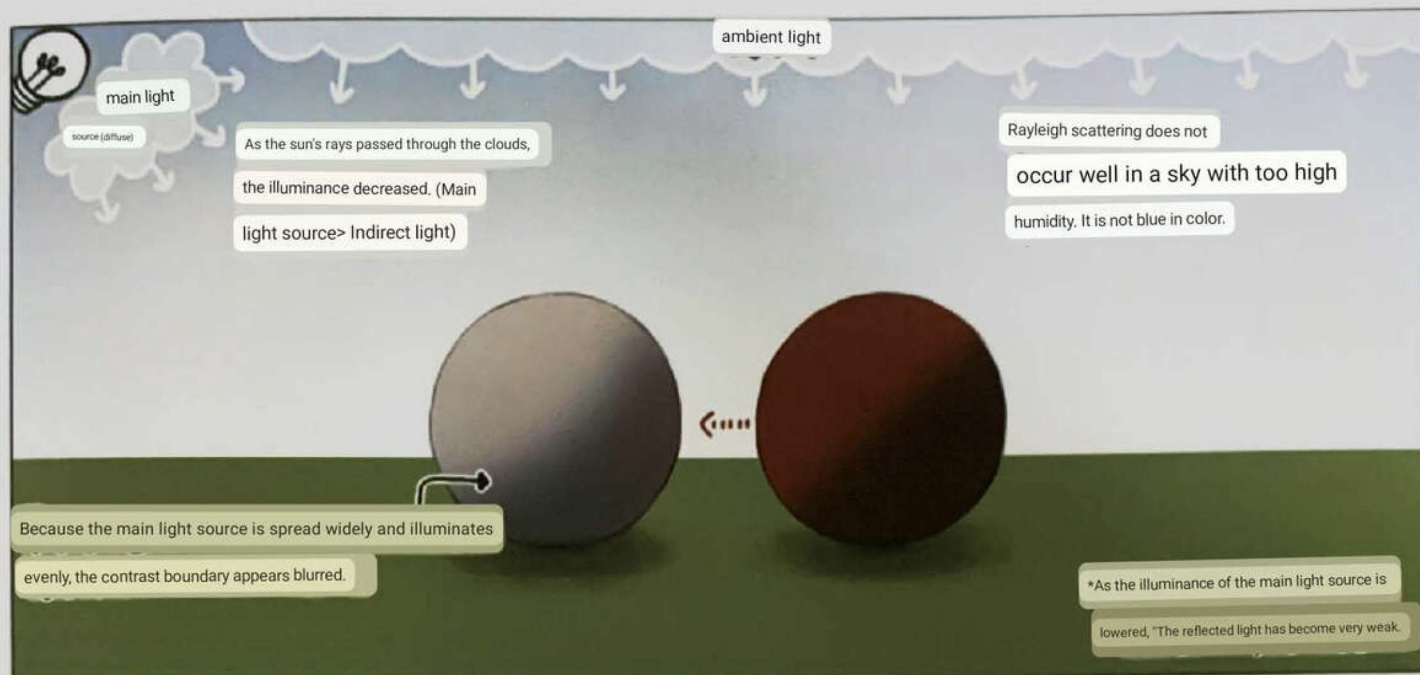
light blue to lower the brightness and give it a blue color.

You can express the reflected light from the ground by

gently painting the color of the delay from

the floor and adding it with an overlay compositing.

## blur

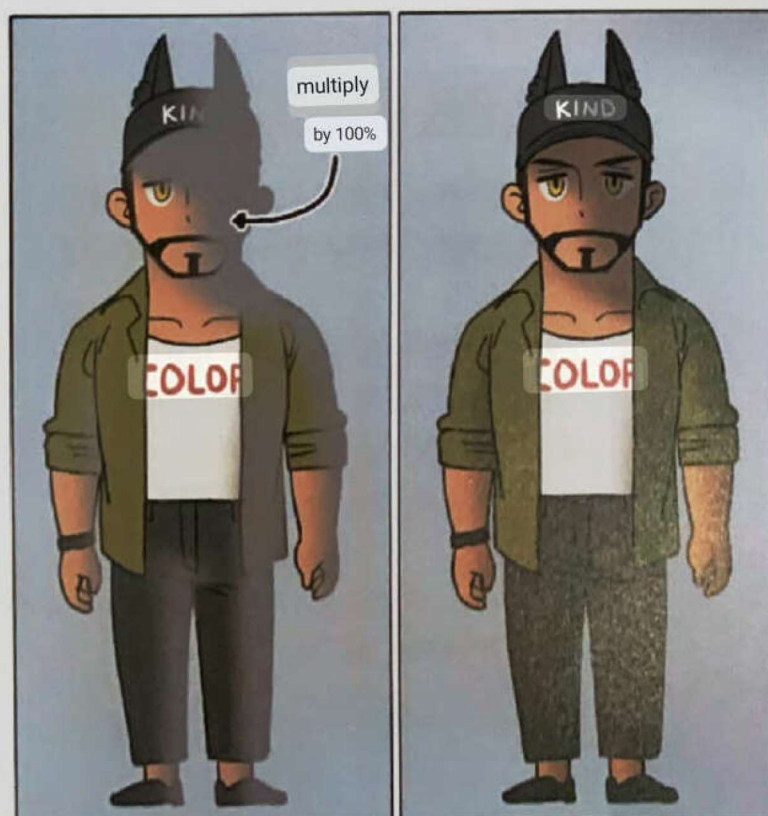


Sunlight shining through an overcast sky diffuses the direction of the light, dimming it a bit, and showing the boundaries of soft shadows. In the sky, the

illuminance of ambient light is determined by the thickness of the clouds, and moisture in the air causes mass scattering, so it does not appear blue.

The contrast between the objects is weakened and the three-dimensional effect is reduced, but the natural light shows the appearance and color of

the object evenly. The colors created by the light are rather easy, but you can see the shape of the object most accurately, so it is often seen in portraits, etc.



## simple synthesis

Contrast boundaries are softly expressed.

The list appears without any special color change.

The shadows are multiplied by color and combined to lower the brightness a little without

changing the color. Adjust the opacity so

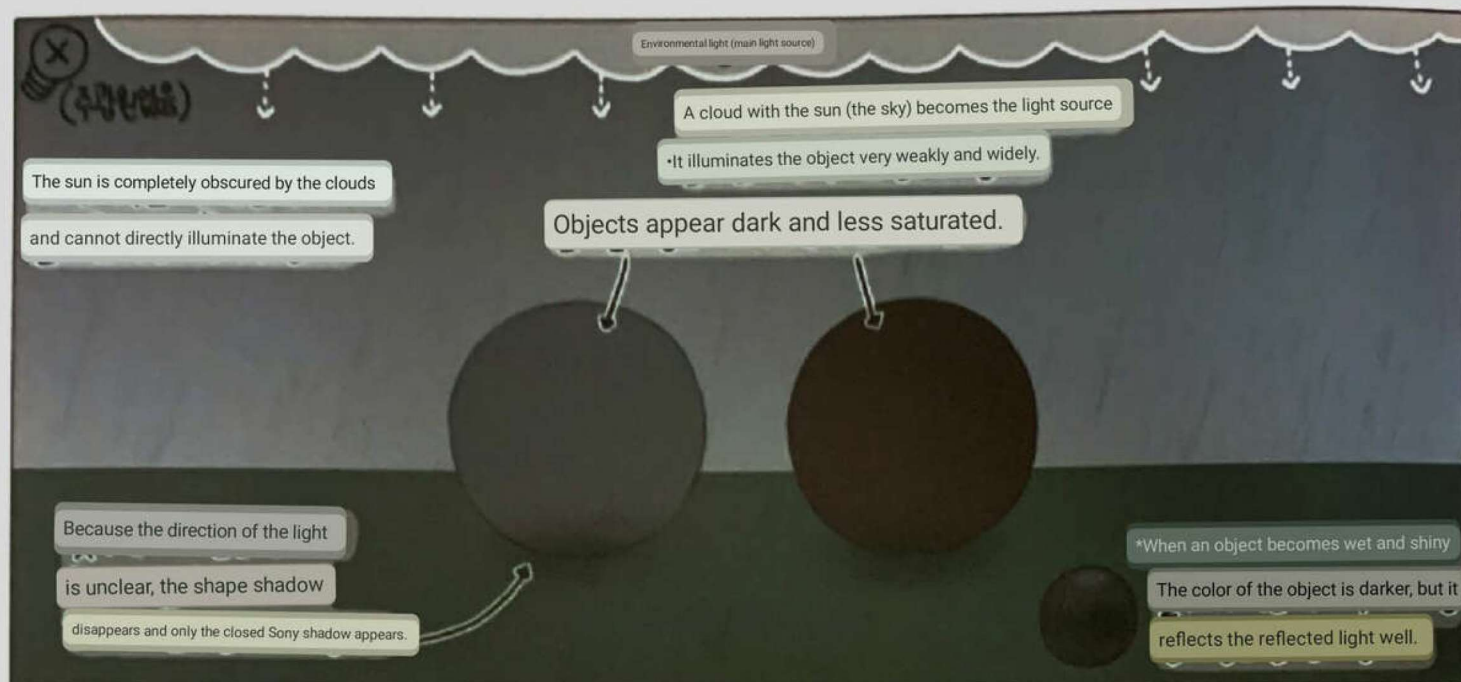
the contrast isn't too high.

Since the illuminance of the main light source is rather weak, the indirect light

is also weak, so it is recommended to omit the expression of reflected light.

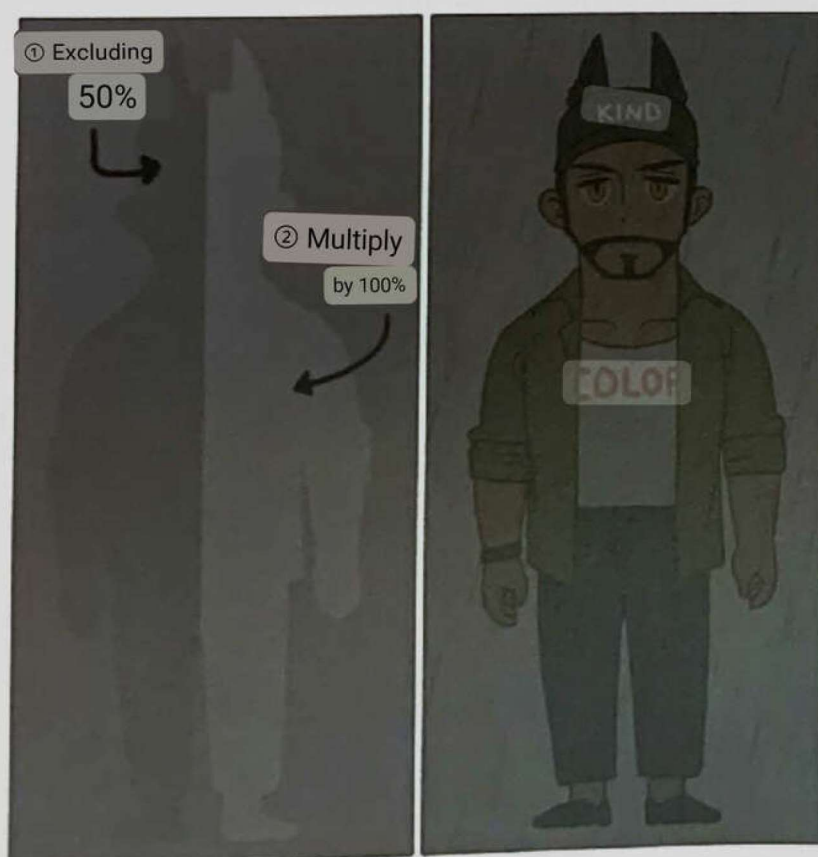


rain



The clouds are so thick that the sun, the main light source, cannot directly illuminate the object, and only the sky, which is indirect light, illuminates the object weakly and broadly. The direction of the light is too wide, so no clear shadows appear, and the color of the object appears dark due to the low illuminance of the light source. When an object gets wet from the rain and becomes glossy, it becomes darker, reflecting the reflected light, making the appearance of the object less clear. For the above reasons, weather is usually avoided in photos and drawings, and a specific dark atmosphere can be used to create a specific situation.

Artificial lighting is very noticeable.



simple synthesis

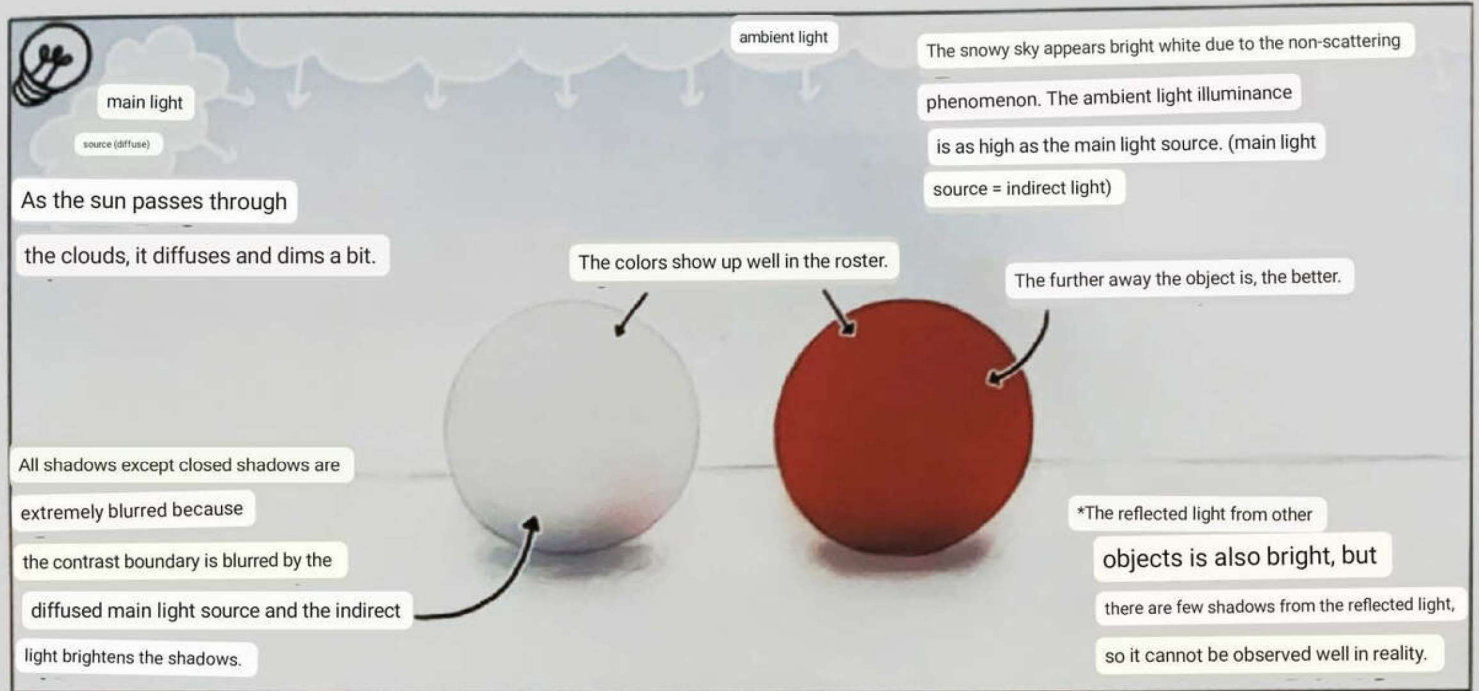
In rainy weather, only closed shadows appear, so it is natural without special shadows.

① Contrast between highlights and shadows is greatly reduced if all objects are combined except dark gray. ②

Lower the brightness of the picture by multiplying and compositing it with gray.

The object should be much darker than the color of the sky, and the wet or shiny object will have a lower brightness.

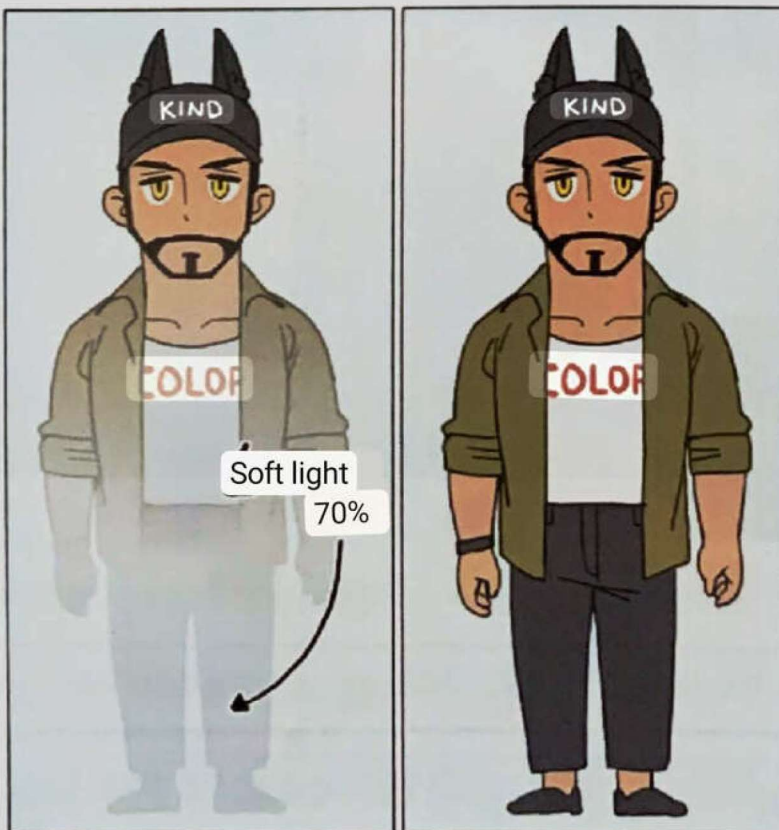
snow (yellow dust)



Under the influence of the white sun, sky, and snow field, the illuminance, color, and incident method of the main and indirect light illuminating the object are

almost identical. If the illuminance is sufficient, the object has a vivid color without shadow, and only the color change due to perspective

is observed well. A similar appearance can be seen in the weather of yellow sand, where sand dust is thick instead of snow in the air, and the color of the sand affects the environment as a whole. You can observe the shape and color of the object well, but it is not often used outdoors because it is not natural light in a general situation.



simple synthesis

Indirect light that casts shadows appears as bright as the main light source, so it looks natural without sharp shadows.

The closer to the snow field, the higher the illuminance of the reflected light, so soft light is synthesized with light gray on the floor to create the effect of illuminating the lower part of the object with indirect light.

Lighting conditions are almost the same even in yellow sand, so soft light is synthesized with sand color instead of light gray.



## Comparison of light and color according to location

Let's find out how the color of the body changes depending on the location and the properties of the light source by comparing the differences.

## Natural light ↔ Indoor lighting



## natural light

The sun, nature's only light source, has a slight warm color, and the sky brightened by the sun has a vivid blue color.

The colors of the sun and sky affect the color of objects somewhat.

The illuminance of the main light source is very high, so all objects shine strongly, and reflected light from other objects is also clearly visible.

When an opaque object appears translucent due to strong illumination

Also, light passing through an object creates a new color.

[What is diffuse descending oviposition? 108P>



## indoor lighting

Artificial light, or room light coming in through windows, is often purer white than the sun. White light only affects the brightness and saturation of an object depending on the illuminance.

The illuminance of a light source that is weak compared to the sun is sufficient to illuminate the object, but indirect light such as reflected light does not appear well.

The material of the object, especially the texture of the surface, is well revealed.

## light source color

在

## Etc

natural light

Warm color close to white + sky blue

Very strong main light + distinct indirect light

Emphasize material permeability

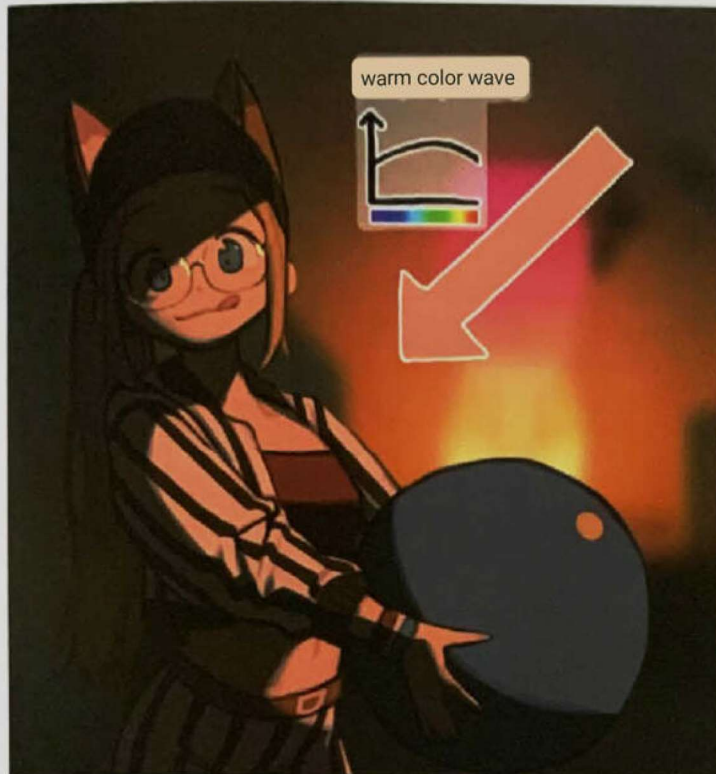
indoor lighting

It looks pure white.

Moderately lit main light + dim indirect light

surface texture highlight

## mood lighting ↔ neon sign

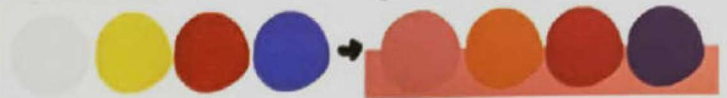


## mood lighting

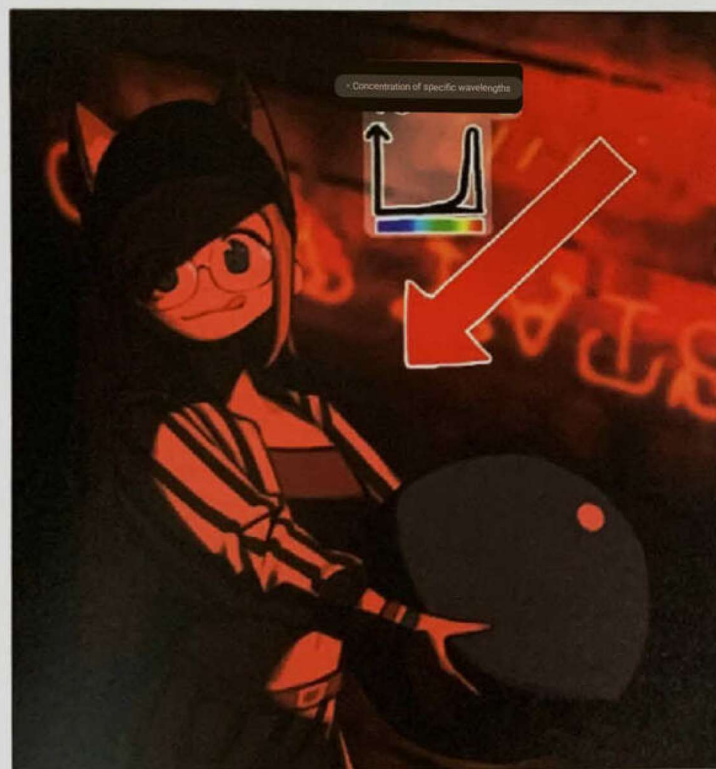
Because mood lighting installed indoors has a large proportion of warm color wavelengths, warm colors appear well on the bright side of objects.

## object color in the list

## (Multiply Composite)



Compared to general white light, the wavelength is not uniform, so the illuminance of the main light source that illuminates the highlights is somewhat lower. When only a light source of a certain color illuminates the room, the ambient light of the same color as the light source appears.



## neon sign

Unlike mood lighting, neon signs have a very strong monochromatic wavelength. In this case, the object appears in one color regardless of its intrinsic color.

## object color in the list

## (Multiply Composite)



Intense color and saturation have the effect of increasing illumination, but the more vivid the color of the light source, the weaker the energy compared to white. Therefore, the value of the object appears low.

Objects of the same color as the light source are difficult to distinguish from white in this light. Conversely, objects of complementary color appear black.

light source color

do

Etc

mood lighting

light of a specific color



Low illuminance compared to white

The degree to which the color of an object is warm

neon sign

Light with only a specific color ((

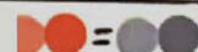


Vivid saturation, but low actual illuminance

Regardless of the color of the object, only the color of the light source appears

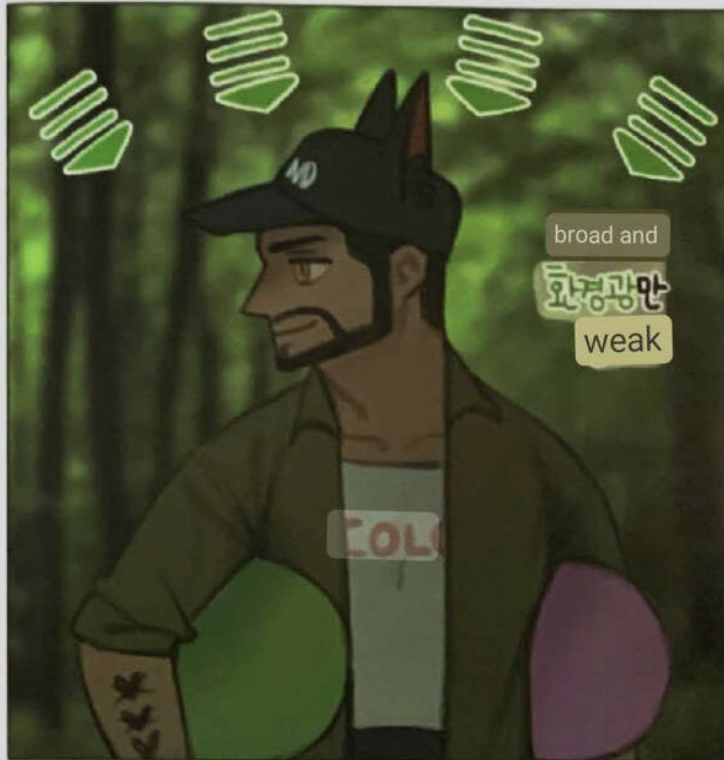


For reference, the value of the white object in the two light images is darker when it is a neon sign.



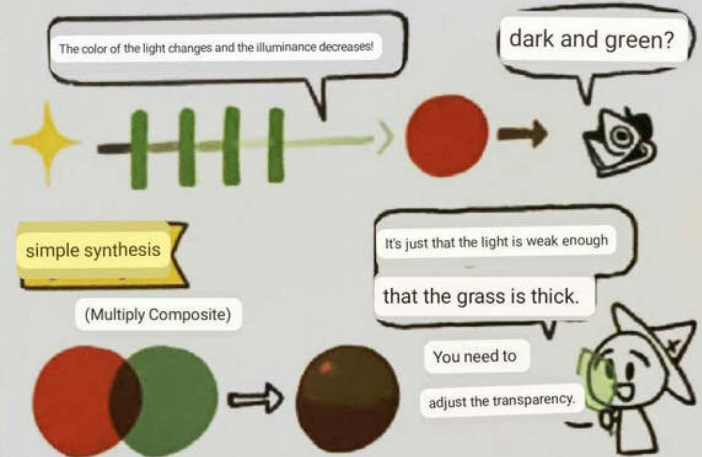


In the bush ↔ in the water



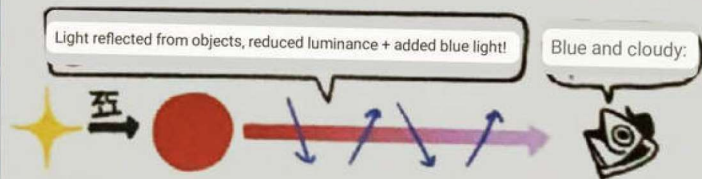
in the bush

The light that penetrates the water is green due to the effect of the color of the plants. As light passes through a thicker object, its direction is scattered and the illuminance decreases. As the light shining on the object is weakened, the colors we observe also become darker.



underwater

Deep water turns blue due to light scattering. The intensity of light reflected from an object and reaching the eye is called luminance. (After) The luminance is affected by the space between the object and the eye independently of the light source, and in a space such as water, the luminance decreases along with the illuminance.



Dark shadows are also affected by blue light scattered in the water, which makes the shadows bluish and reduces the contrast with highlights. This phenomenon also occurs in air.

light source color

tone/luminance

Etc

in the bush

Green (plant color)

The light incident on the object is low.

As the illuminance decreases, the brightness and saturation decrease.

underwater

The light source itself has only low illuminance.

The light reflected by the eyes, the luminance is low.

Added blue light to the shadow as the luminance is lowered - Reduced contrast

The back canal is often referred to in air perspective.





When light passes through a specific

material, changes in the properties of light, such as illuminance,

color, and volcano, can be easily observed in nature.





PART 03

light



# 1\_Lighting

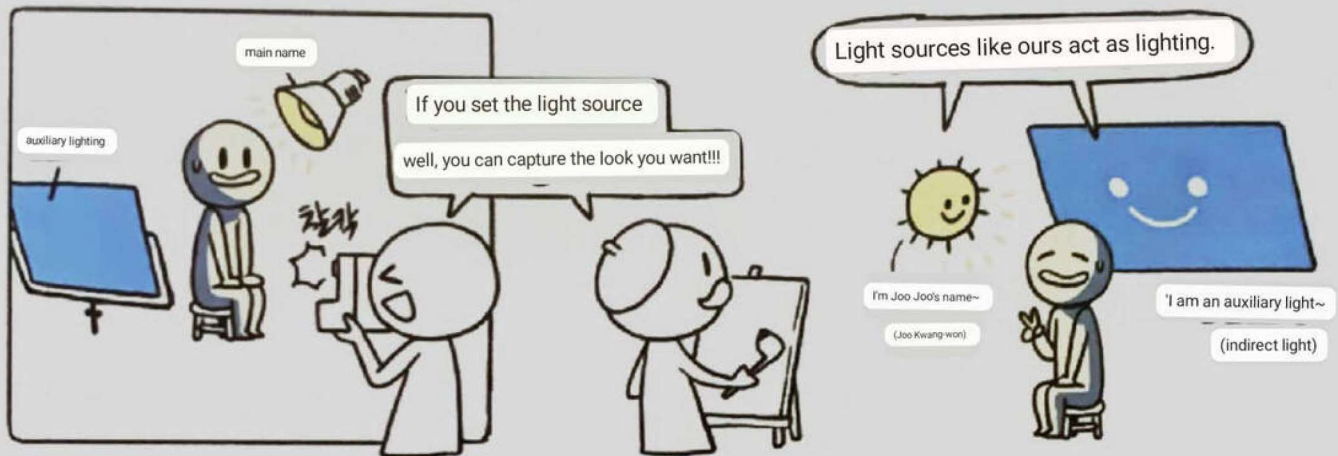
The difference between the color and illuminance of the light source affects the display of the object's color, but does not fundamentally change the appearance of the object's highlights and shadows.

However, depending on the lighting method and direction of the light source, the shape of the highlight, shadow, and contrast boundary changes, so the appearance of the object may look different depending on the lighting.

## 1. What is lighting?

The act or function of illuminating a place for a certain purpose is called lighting in photography.

Because painting and photography have something in common that different types of light create color, understanding the lighting that photography deals with will help you with coloration.

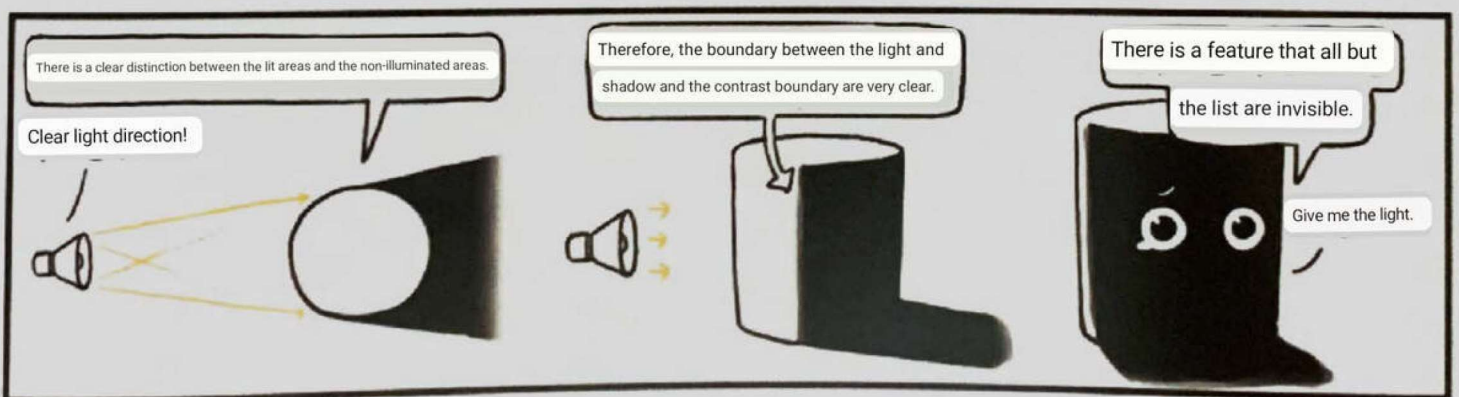


### 1-1 Classification according to survey method

#### ① Spotlight Light source is

small in size and intensively illuminates a specific part of an object in a certain direction.

The shape of the shadow is very distinct, so the direction of the light is intuitive.



A typical point lighting is such an example.



'The sun is originally a divergent light'

'Because it is so far away from Earth, it acts as a kind of spotlight.'



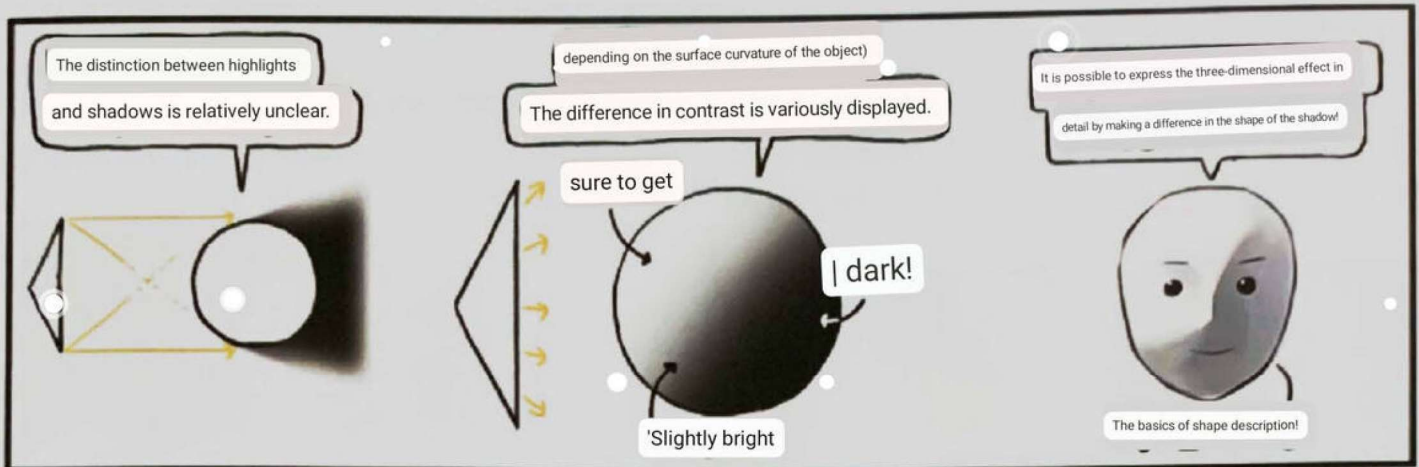
1) Divergent Light: A ball that surrounds you in all directions



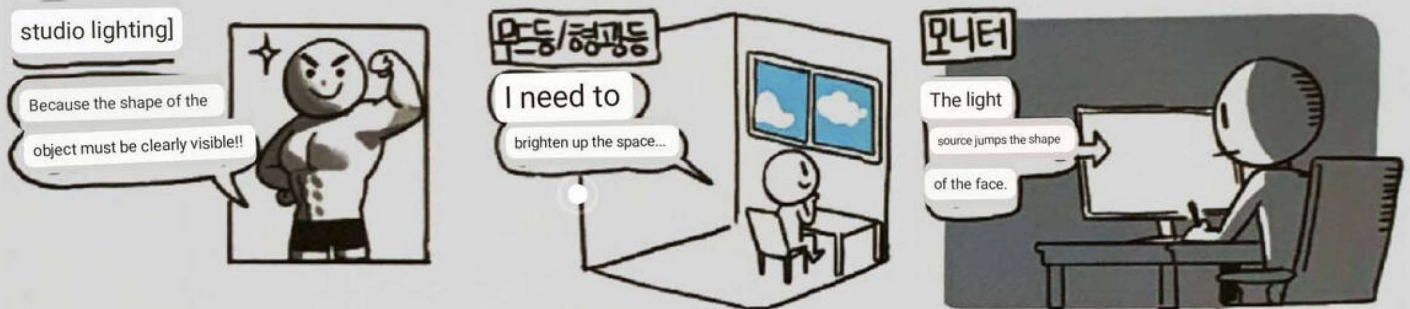
## 2 diffused light

It is a light that projects light in a wide direction to illuminate the object evenly across the object.

Compared to point lighting, it shows a softer border between light and dark, so it can represent the three-dimensional shape of an object well.



A typical diffuse lighting is such an example.

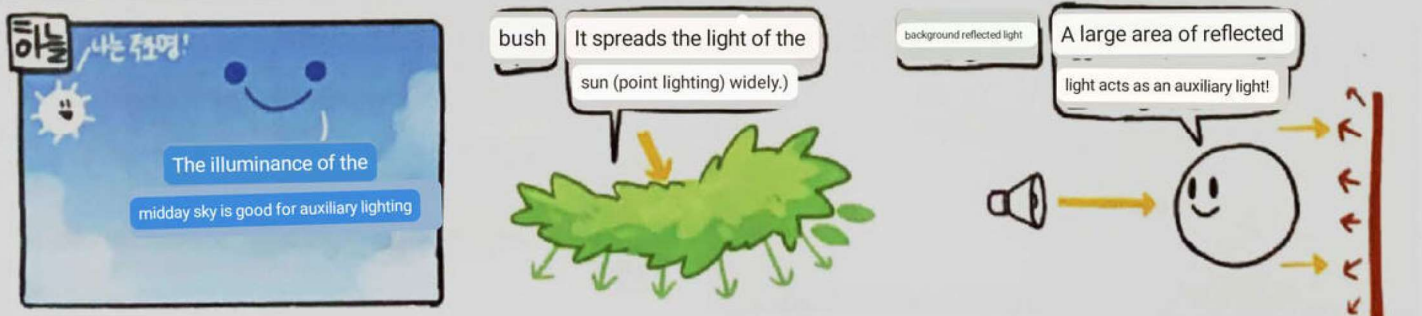


## ③ Fill light

A light that illuminates an object from a very wide direction. In nature, an environment such as the sky acts similarly to auxiliary lighting. It is mainly used to light shadows created by point lighting or diffuse lighting, and weakens the contrast of light and dark.



A typical auxiliary lighting is such an example.



## 1-2 Classification according to the number of lights

There is no change in the lighting method, but the shapes of shadows or contrast borders are classified according to the number of lights.

### ③ In case of illuminating only 'Keylight' - 1 point light

1) Lights that create major shadows in three

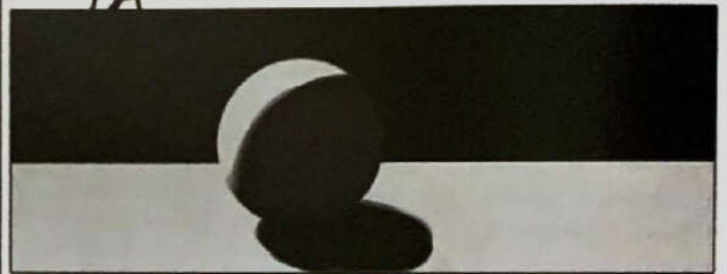
#### spotlight

The contrast between highlights and shadows is extreme, and the shadows become complete darkness for a dramatic effect.



The contrast created by the name of the master can be seen very clearly!

It looks like the light direction is good!



[In addition to the main light, indirect light such as

reflected light can be projected widely separately from the light.



#### diffuse lighting

Contrast borders appear softly, revealing three-dimensionality and detailed structures.



Contrast borders appear abundantly • It

definitely shows a three-dimensional effect!

It seems like it would be suitable for a body profile picture...



(However, the dramatic effect is weak because the direction of the light does not appear well.



This is a versatile light.



When illuminating an object with one light, the shadows are too dark to reveal the overall appearance of the object.

In photography, two or more lights are used to illuminate objects. Also in nature, one-point lighting is not universal.

2. When other light sources such as auxiliary lights are illuminating together - two-point lighting

If the illuminance of the main name is stronger than the auxiliary

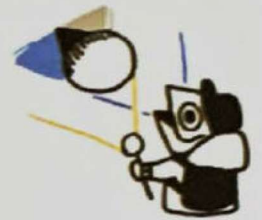
light, it can be expressed that there is a light source that properly reveals the light direction when the diffuse light is additionally illuminated in the shadow.



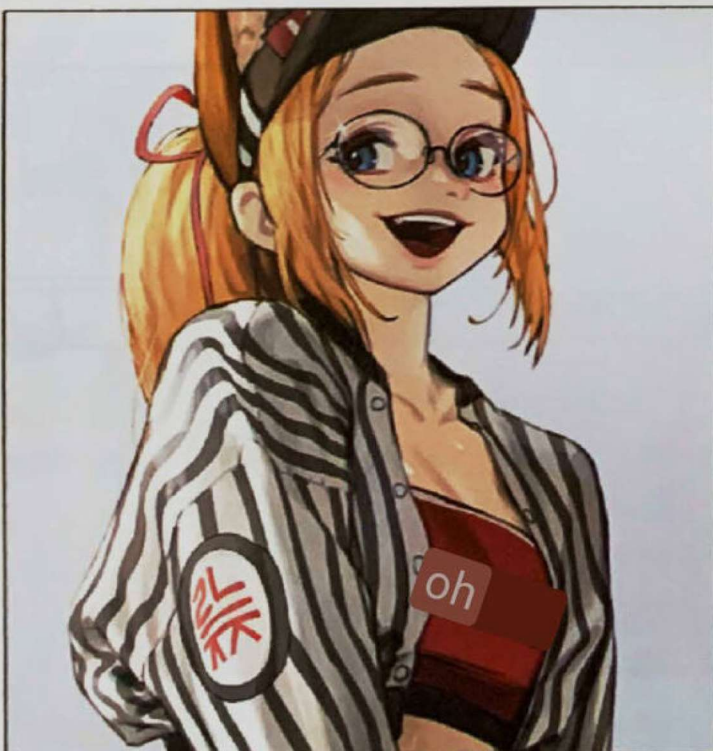
Even in the same type of lighting,  
depending on the role, it can be classified  
as a /auxiliary lighting!



Since there are multiple light  
directions, shadows may appear overlapping.

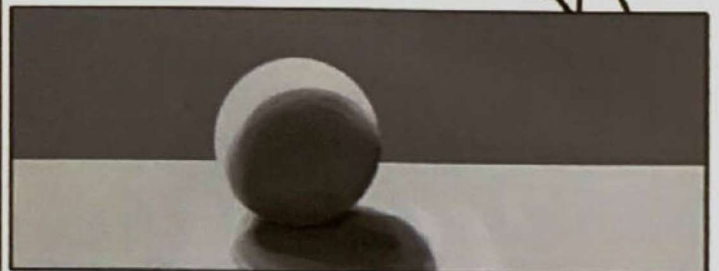


By illuminating the area of the shadow that the main name could not cast with a wide auxiliary light, you can naturally illuminate the overall appearance of the object.



If the shadow area that the main name's light  
doesn't reach doesn't appear black, it  
means there's an auxiliary light!

Still, closed shadows are still dark!



This is the most common lighting. It  
is similar to the relationship between the midday sun and  
the sky. "The most familiar sight to our eyes.





When the illuminance of the main name and the auxiliary light is

similar, if the illuminance of the two lights is almost the same, it is difficult to distinguish between the highlight and the shadow.



In the 'Double color lighting technique, colorful shadows can be created by illuminating the shadows created by the main name with clear lighting. Areas where two lights overlap and incident become brighter, and areas where neither light shines nor closed shadows become black.

At first glance, the contrast between the colors of the highlights and shadows is similar to the light of the setting sun, but the major difference is that the illuminance of the two lights should be approximately the same.



white-out

On a cloudy day, the illuminance and color of the main light source, reflected light, and ambient light become the same, a phenomenon called whiteout appears, and all shadows except closed shadows disappear, making it impossible to determine the perspective of the space.



33 point lights



In an environment where the main name and auxiliary lighting are lit together

A technique for distinguishing objects from the background by shining light on the edges of the objects.

It's called three-point lighting.

The three-point lighting technique, in which each light is installed according

to its role, can effectively distinguish the subject from the background,

so it is a basic lighting technique used in photography and painting.



## 2 Illumination terms used in the figure

As mentioned earlier, photography and painting share a number of things in common in terms of dealing with lighting. Using character illustration as an example, let's find out what lighting terms are used and what role they play.

## Highlight

It is the part that shines brightly by the main name, especially the brightest part. Depending on the material of the object, it may have a clear shape, which is called Specular.

Rimlight A distinct light shines on

the outlines of an object to accentuate the silhouette and separate it from the background.

•Reflected light Light reflected from an object

or space around it is additionally

projected onto the object. The degree

of reflection varies depending on the material.

\*Ambient light does not appear clearly on the object,

but it does affect the brightness and color of the shadow.

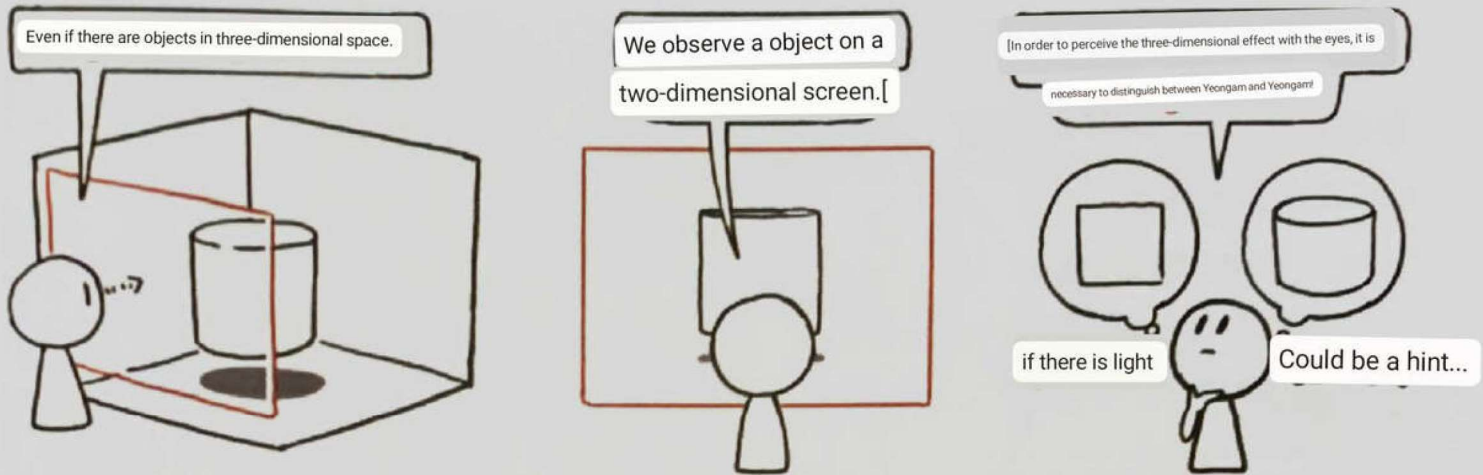
The names of the lights in the pictures

may differ depending on the coloring style!



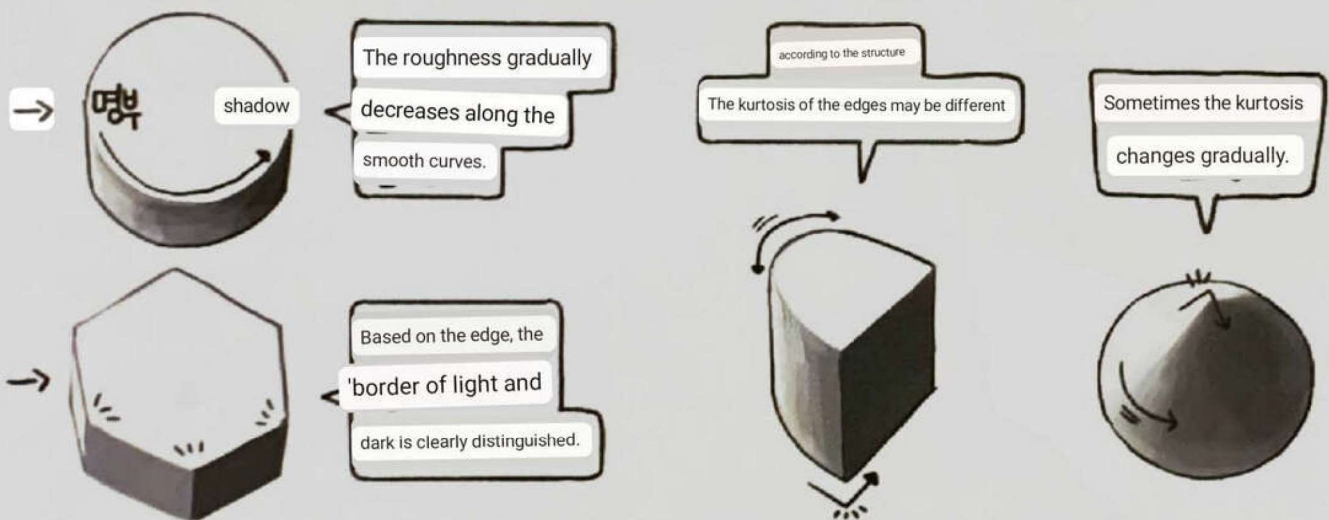
## 2. Lights and Shadows

In order to reproduce the three-dimensional shape of an object on a flat space, the shape of the shadow produced by the light source is very important.

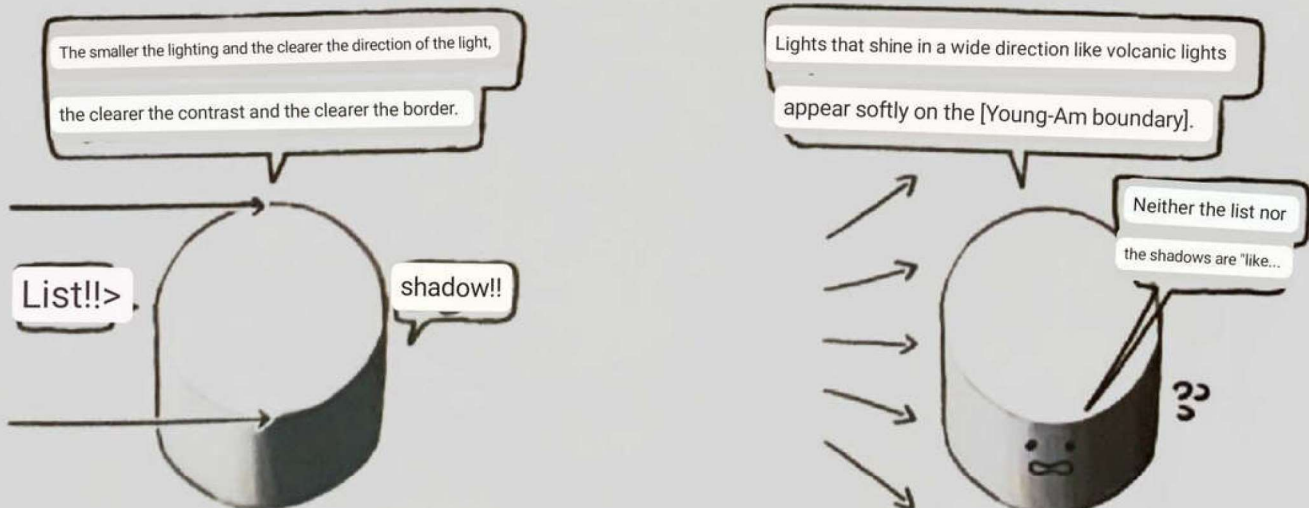


### 2-1. Factors affecting the appearance of shadows

First of all, in the same lighting direction, the shape of the shadow and the gradation of the contrast boundary' appear differently depending on the kurtosis of the shape.



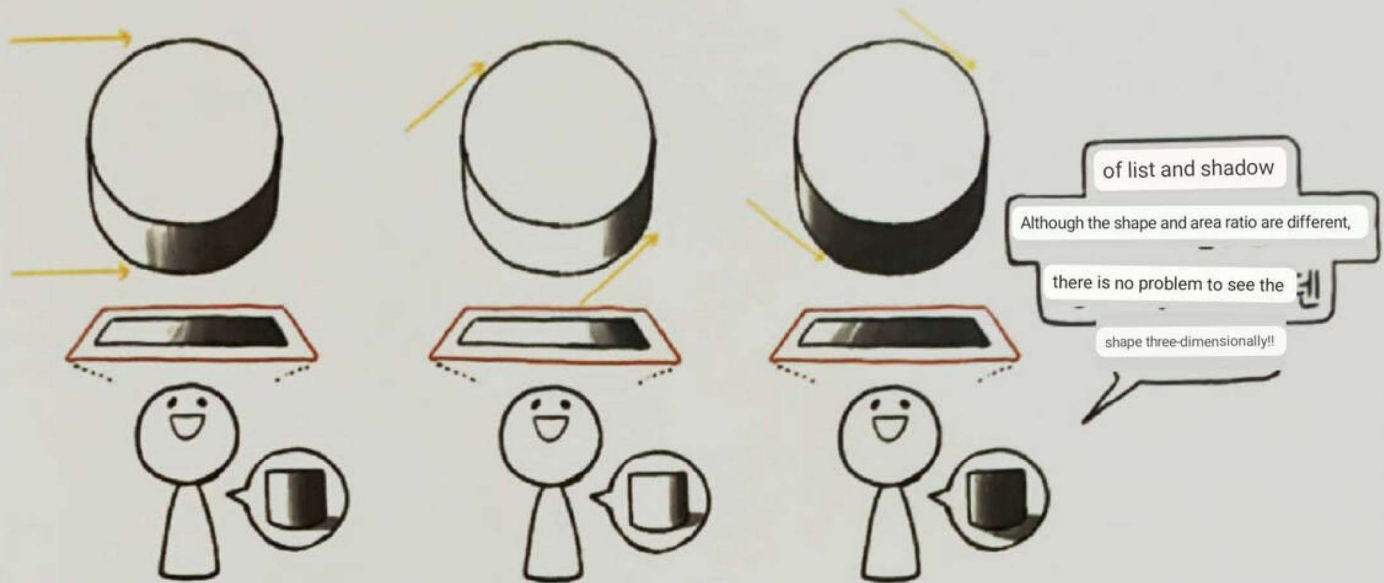
Also, as noted earlier, the gradation of the contrast boundary appears differently depending on the illumination method.



Gradation: The stage in which the brightness changes from the high part to the low part.



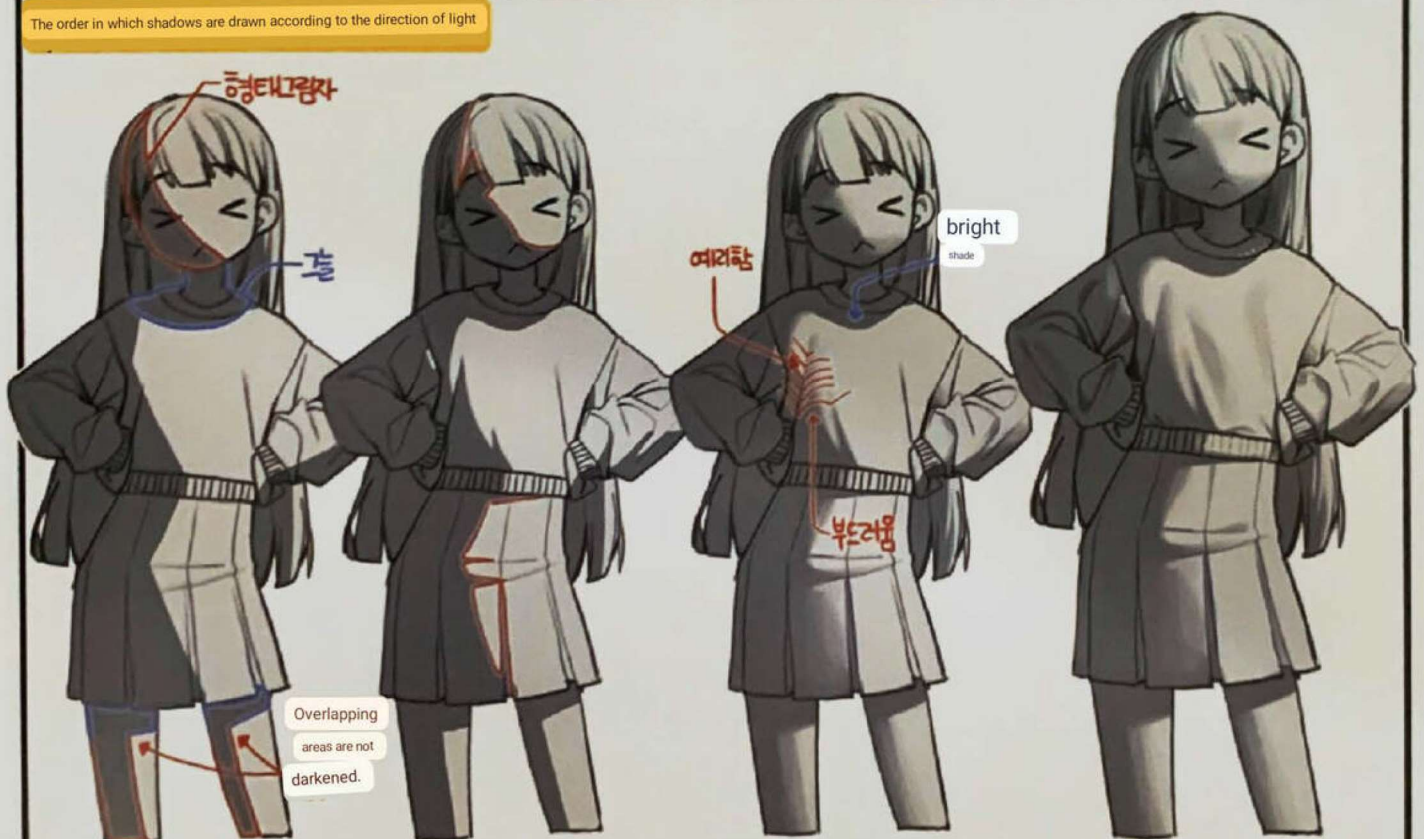
However, even when the same object is illuminated by the same irradiation method, the shape of the shadow is completely different depending on the direction of the light.



In addition to the difference in the shape of the object, you can create an infinite number of shadow shapes with different types and directions of lighting. Among them,

let's take an example of the direction of lighting that is typically used in photos and drawings to find out the difference between the shape of the shadow and the contrast boundary.

The order in which shadows are drawn according to the direction of light



After ignoring the complex structure of the object and replacing it with a simple shape, the shape shadows and shades that occur depending on the light direction are made into a clear shape.

The light-dark boundary created by the main name is specified according to the structure of the object.

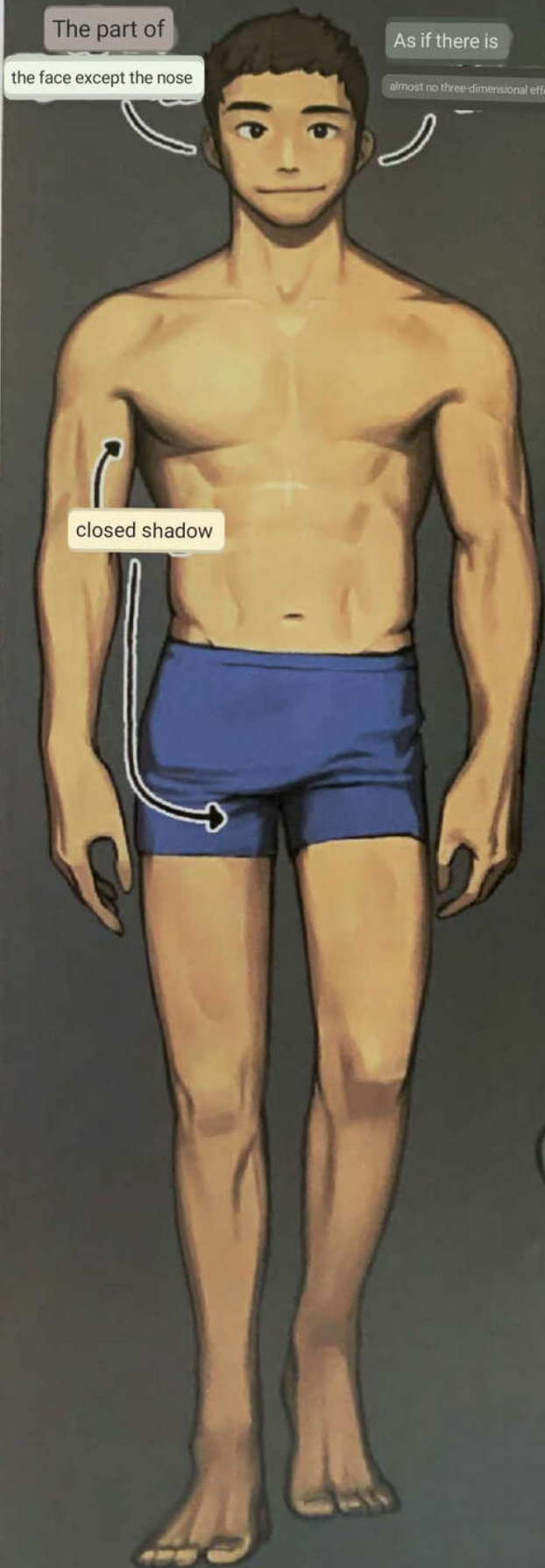
According to the kurtosis of the corner, it is expressed naturally while distinguishing the light and dark boundaries.

Adds subtle contrasts in highlights and shadows to create more detailed structure.

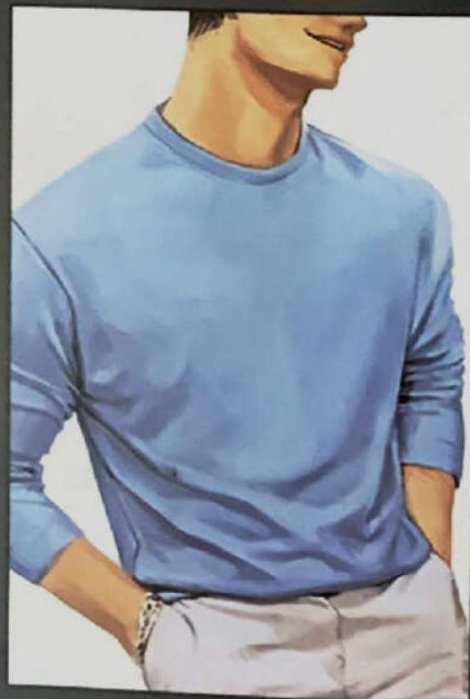
2-2 Typical lighting direction

## front light

Light that shines from the front of the subject, also called pure light. You can make a delicate depiction, but the shadows are not well exposed, so the three-dimensional effect is not well expressed. It is used more for educational material photos, archival photos, and commemorative photos rather than works.



The farther back from the most protruding part, the darker it gets. The shade stands out more than the shape shadow. Areas that are inclined at an angle from the light are dimmed, resulting in relatively sharp shadows. Therefore, the boundaries of the volumetric structure are rather dark.

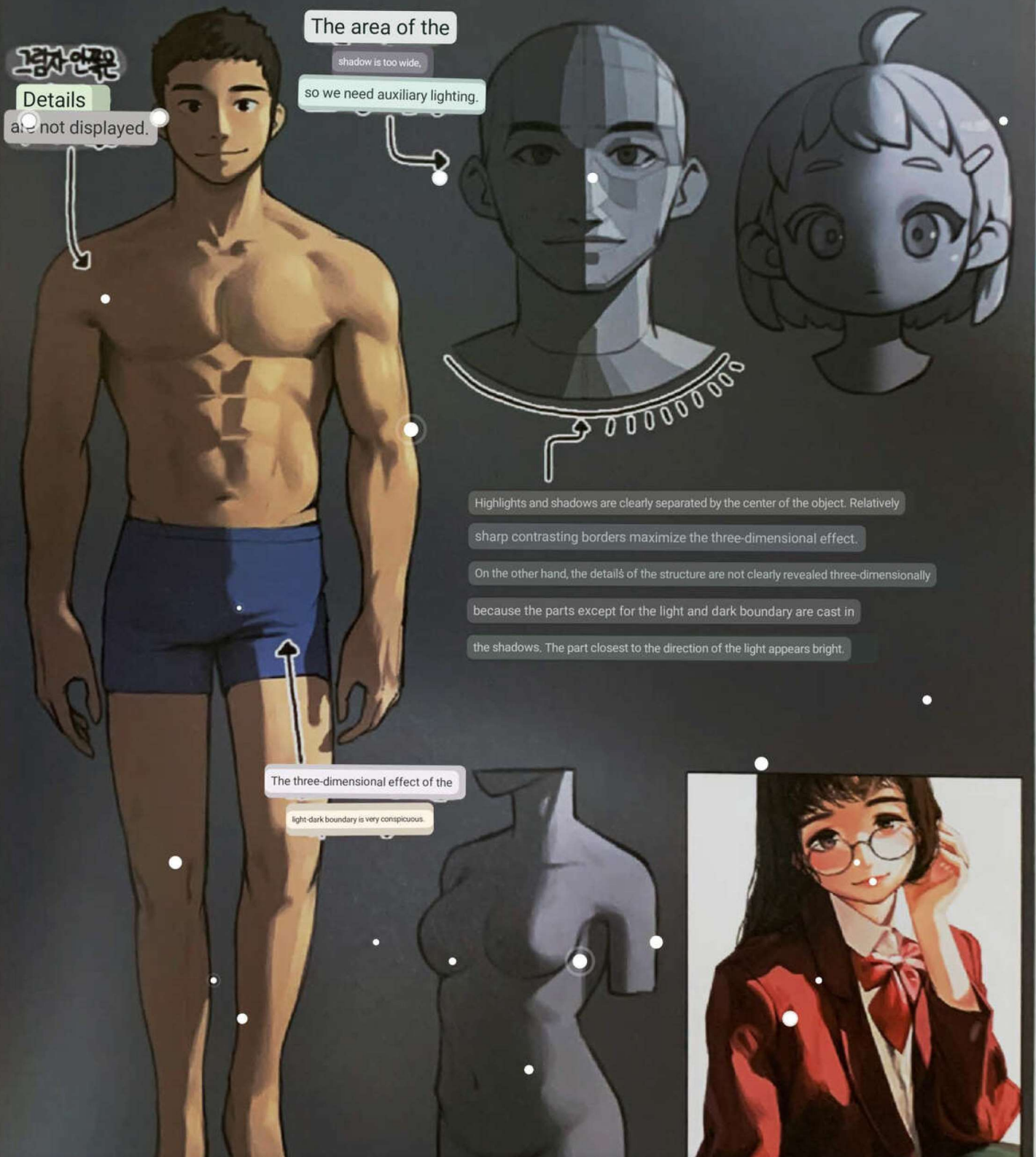




## side light

When the light illuminates the subject from the side, the opposite side of the light creates a sharp shadow, maximizing the object's

three-dimensional effect. Metering can create dramatic depictions, but the shadow area is too wide, so auxiliary lighting is used for a natural depiction.



Translated text

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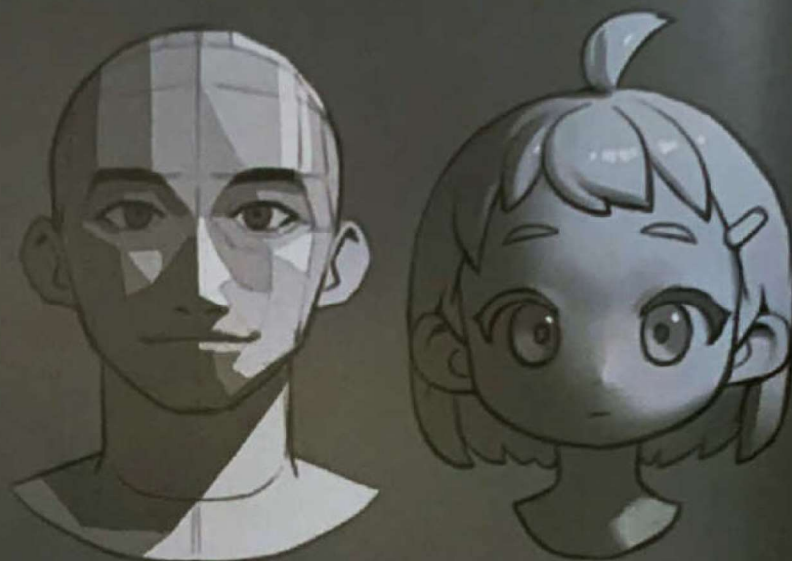
🌐 Open in Translate

## 사광(Plane light)

Light that shines obliquely from the front of the subject is called stray light or transfer light. It is similar to the direction of afternoon sunlight. It is the most used lighting direction for depicting people because it can express both delicate and three-dimensional effects.

Shape shadows  
and their nutritional  
boundaries are different.

The boundary of the shape shadow  
is obliquely cast on the object,  
showing the sense of structure of the object.



It is advantageous to express the structure of an object in the form

of a shadow as the contrast boundary runs across the object at an angle.

The rounded corners and shades stand out with different gradation expressions, and  
the brightest parts appear in different positions

depending on the lighting direction and the structure of the object.

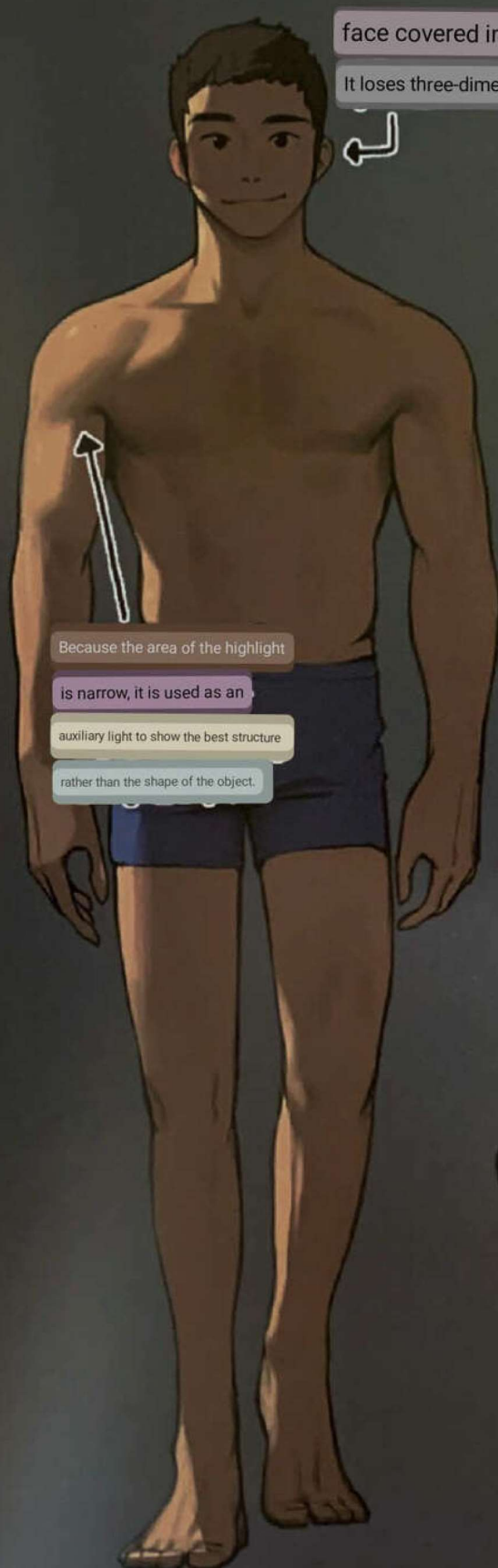
The smoother the surface, the sharper it is.





## Cross light

It is a light that shines about 45 degrees from the back of the subject. As opposed to streamlight, the object's precision area is obscured by shadows. The area of the highlight is narrow, so it is not used well as the main name, and it is used as an auxiliary light to indicate the hidden area by illuminating the shadow area.



Because the area of the highlight is narrow, it is used as an auxiliary light to show the best structure rather than the shape of the object.

face covered in shadows

It loses three-dimensionality.



The part you want to depict is covered by shadows, which reduces the three-dimensional effect, but the area where the light is shining clearly separates the background from the object. Because the area of the highlight is narrow, it is difficult to express the rounded surface, but it can show even small irregularities on the surface by shining a clear light. It is an auxiliary light, but depending on the role, the illuminance is very strong.

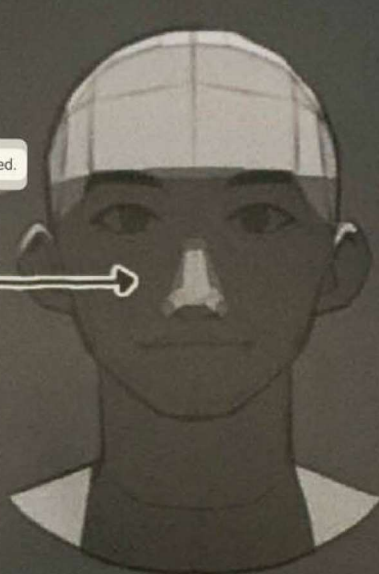
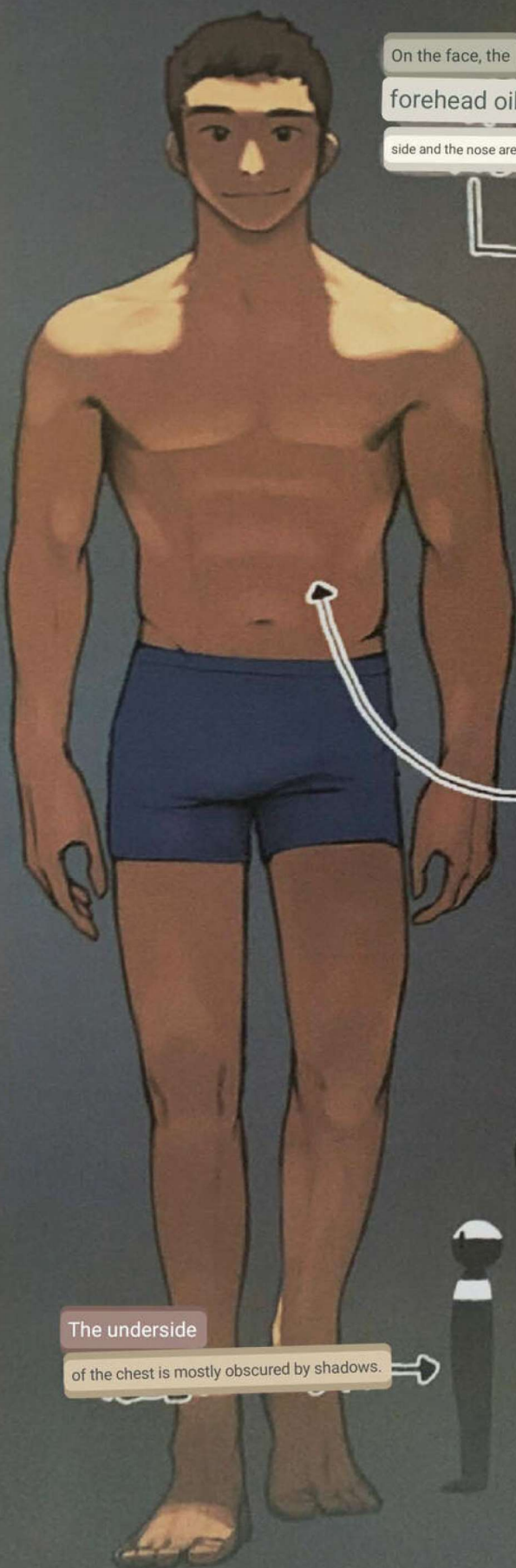
(Historical light can be used as a rim light)



## 하향광(Top light)

Lighting from the top to the bottom of the subject is called downward, and among them, lighting from the crown of the head in a straight direction is called direct light. Although the area of the shadow is large, only the structure that clearly protrudes from the object is emphasized, so it is a lighting that is used a lot in dramatic productions.

On the face, the  
forehead oil  
side and the nose are added.



Only parts adjacent to the light and structures protruding from the object are illuminated. Most of the object is covered by the shadow, but the structure can be emphasized enough, and if the shadow is illuminated with auxiliary lighting, dramatic production is possible. As it shines toward the floor, the light reflected from the floor acts as an auxiliary light, and the normal highlights and shadows are reversed.

The underside

of the chest is mostly obscured by shadows.





## Backlight

Lights from behind the subject. The highlight of the object is very narrow and most of it is obscured by shadows except for some object outlines. For this reason, the backlight is not used as a main name, but as a secondary light that serves as a rim light that clearly shows the outline of an object.

Narrow and simple list

shape close to a line

the area of the highlight is very

narrow, it cannot show a three-dimensional effect with backlight alone.

The area of the highlight is extremely narrow, so the gradation of the contrast

boundary is very clear, and even the smallest irregularities of the object can be displayed

with clear lines. The area of the shadow is too wide to be used as the main

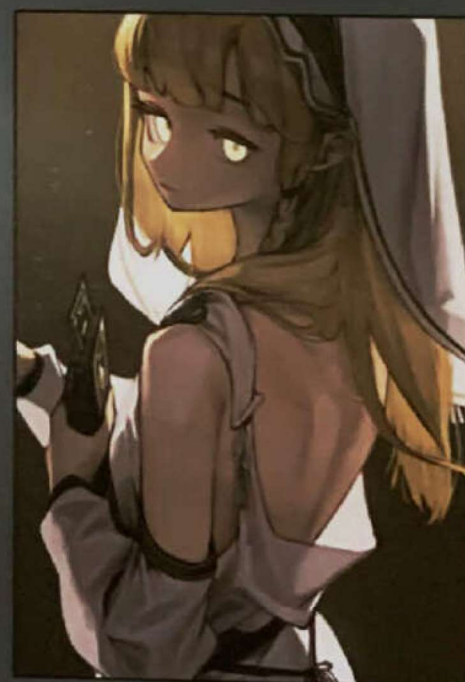
name, but it is used as an auxiliary light in various productions because it can separate

the object from the background and make the screen richer.

It is better to separate the sense

of space between the object

and the background rather than the shape of the object.



## PART 04

texture

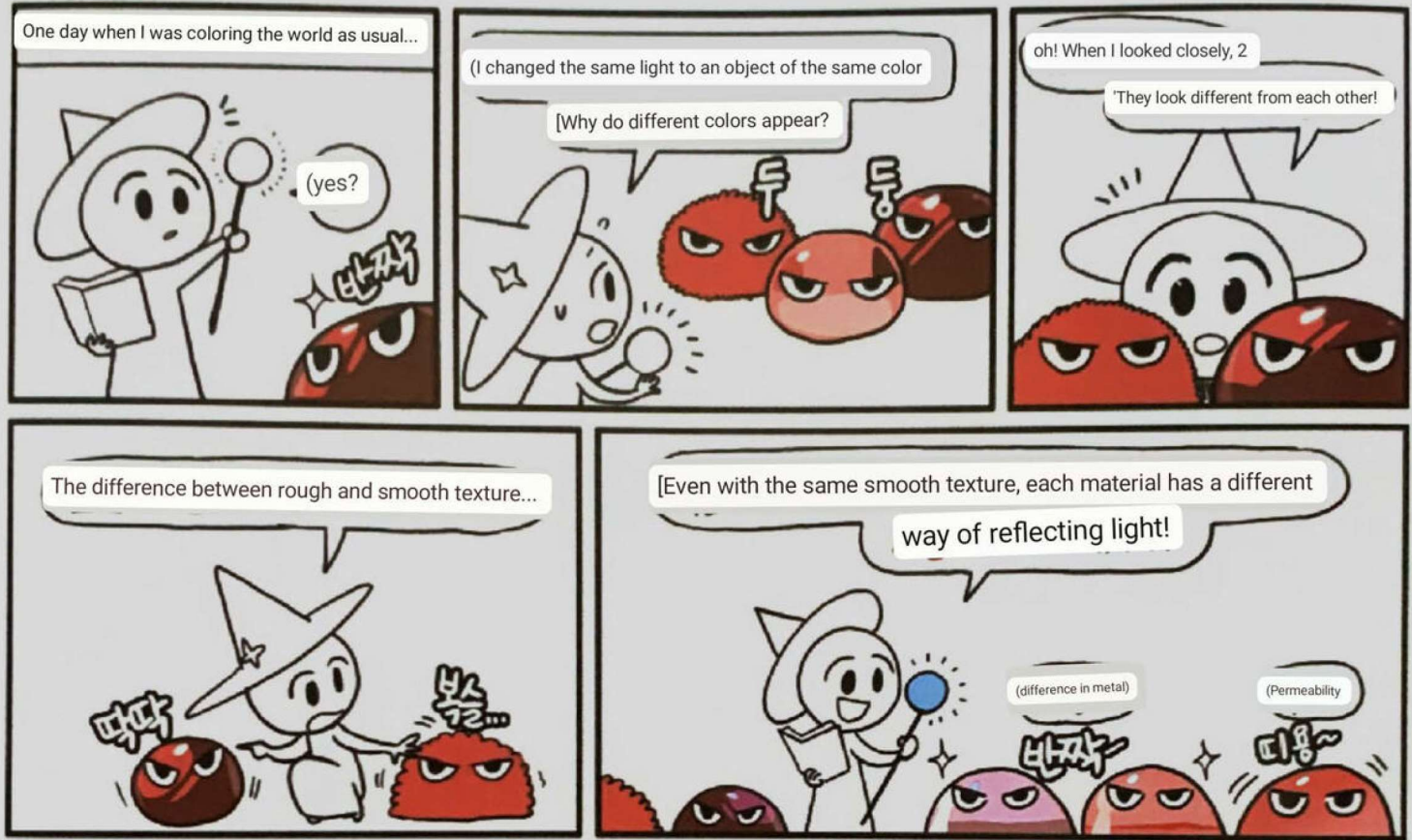


HERE ON



# 1\_ Material

## ► What are materials and textures?



As an object absorbs and reflects a specific wavelength of visible light, the object takes on color, and a shadow appears depending on the illuminance of the light. However, there are cases where objects of the same color have different colors even when the light of the same property is illuminated.

Why? When light hits an object and is reflected, how it is reflected depends on the properties of the object rather than the

properties of the light. The properties of different objects are called materials, and the difference between the surfaces that directly reflect light among them is called texture.

of an object

If you want to know the exact shape,

you need to know the

difference in materials

besides light and color!

Let's start with the basics...

**material**

Classification of differences that occur when reflecting/absorbing/refracting light according to the intrinsic properties of an object

- metallic
- 투과성(Penetrability)

**texture**

Classification of reflectance differences depending on the microscopic curvature of the surface of an object

- Specular reflection: The incident light is reflected in the correct direction and the light arrives as it is.
- Diffuse reflection: The light incident on the bright spot is diffused disorderly and evenly due to the fine curves.

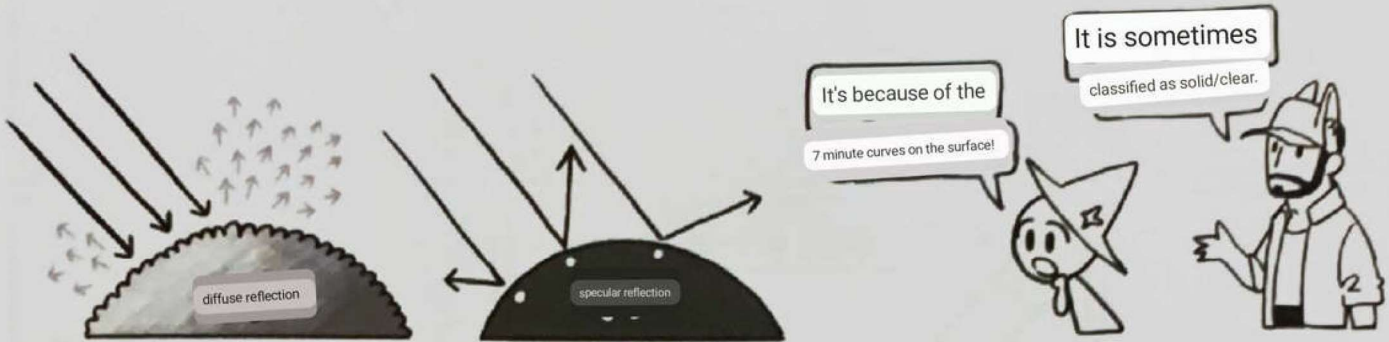
It is important to note that the texture of a surface is a subclass of material!

Even objects of the same color reflect and transmit light differently depending on the material of the object.

## texture

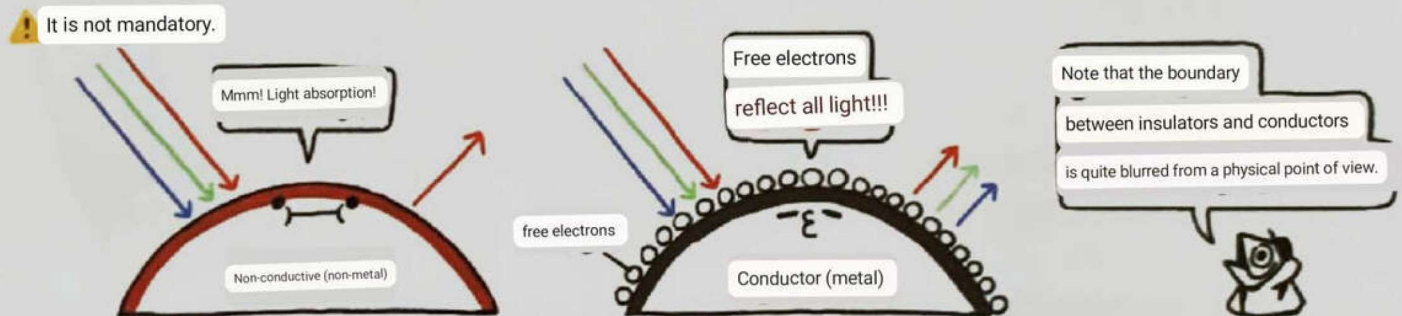
Depending on the roughness of the surface of the object on which the light shines, light may be reflected as it is or diffused and spread.

In other words, the texture of the surface determines how clearly the light source or reflected light appears.



## metallic

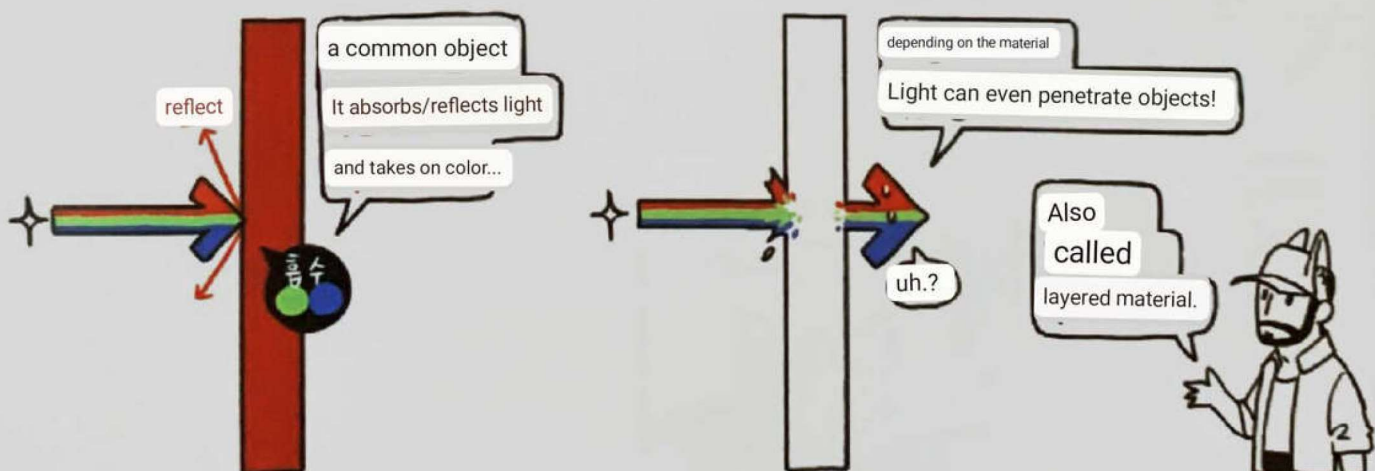
Conductive metallic objects can interact with wavelengths of light and reflect light at wavelengths that it would normally absorb. An object with a smooth surface and high metallicity reflects the light source and image as it is, and sharp metal or mirrors are typical examples.



## 투과성(Penetrability)

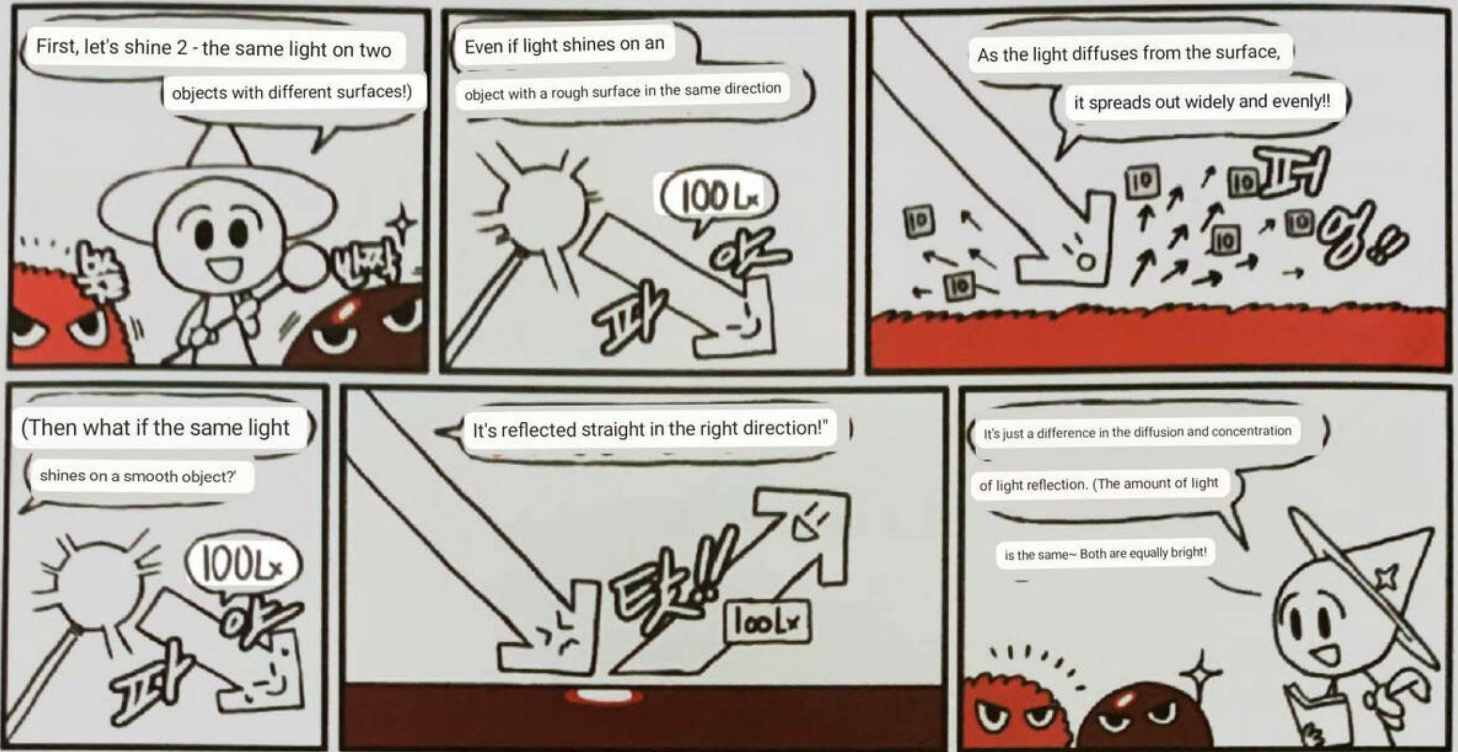
Depending on the characteristics of the material or the thickness and hardness of the object, light is transmitted through the object without

being absorbed or reflected. As light passes through an object, refraction, dispersion, and scattering may occur, and the properties of light may change at this time.



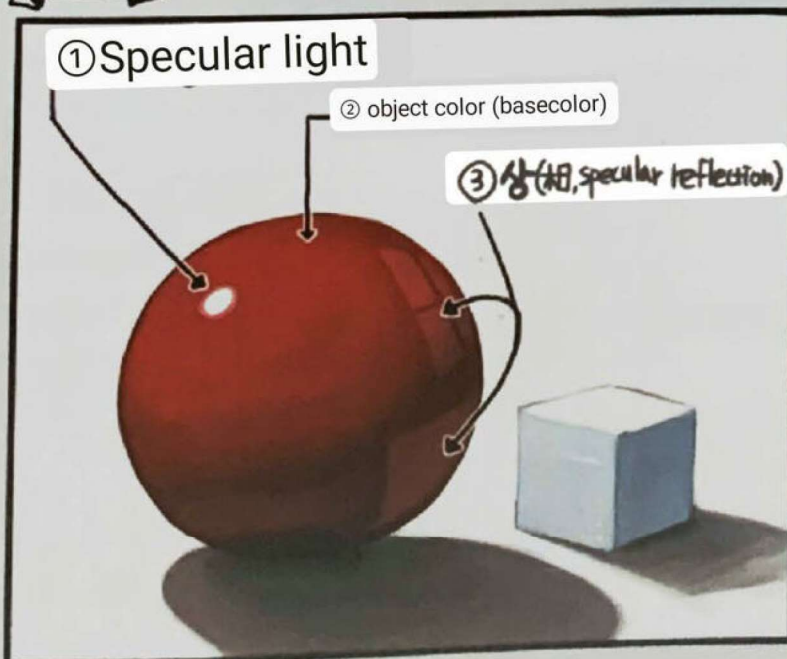


## 1. Texture



If there is a fine curve on the surface where the light shines, the light reflecting the light on the surface of the object is different for each minute curve, so the light shining on the highlight spreads widely as much as the curve is rough. called diffuse). In the part where the diffuse reflection occurred, the light spreads evenly throughout the highlight and becomes brighter, so the color of the object appears intact. Conversely, an object with a smooth surface reflects light in a specific direction, which is called specular reflection. Because the illuminance and color of the light source appear exactly where the light is reflected, the rest of the area reflects the light in different directions. The object color appears dark. In other words, the amount of light reaching our eyes (luminance) is the same, only the degree of diffusion of the reflected light is different.

## Glossary



## ① Specular light.

The light reflected from the light source.

## ② Base color

It is the intrinsic color of an object that appears when the light of the appropriate degree is evenly illuminated on the object.

③ Phase (Specular reflection) Refers to a person who is

clearly reflected by the shape of the light source, the surrounding environment, and the shape of the object.

(Originally, it is the same term as ①)

Rough texture - diffuse reflection



A simple distinction between the raster and the shadow appears as the words spread evenly throughout the raster. The light source can be inferred through the book of the list and the shape of the shadow. Because changes in object color appear intuitively, practice based on diffusely reflecting objects when understanding basic light and color.

Smooth texture - specular reflection



It is difficult to observe the color of an object intuitively because only the part where the light is accurately reflected becomes bright and the other parts appear somewhat dark. Instead, you can observe the sharp reflections of the specular and phase in the highlights, making it relatively easy and accurate to know which light is shining on the object.



### Why stones darken when wet

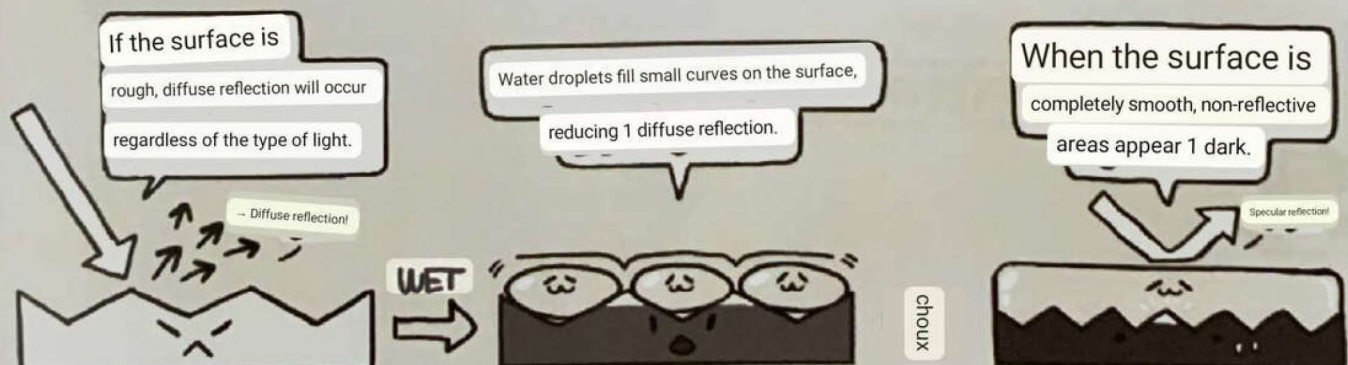
Since ordinary stone has a rough surface, it is one of the most representative materials where diffuse reflection occurs without specularly.

However, if you pick up a pebble in the river and look at it, you will see a dark object color with a clear specular. Why? When a stone

comes into contact with water, water droplets fill between the small curves of the stone's surface, preventing the light from spreading evenly, and the

surface is covered with a smooth surface and specular reflection occurs. An object in which the object is covered with a transparent material is said to be layered. Even

if an object has an inherently rough surface, the object color and speckler may appear at the same time if it undergoes polishing such as coating.







When the surface is rough, the specular is spread evenly throughout the highlight.

It shows the color of the molded object that is spread rather than concentrated

on the hand. Since the properties and shape of the light source do not appear on the

object intuitively, when drawing such a texture, it is recommended to color the object after

thinking about how the object color will look by the light.

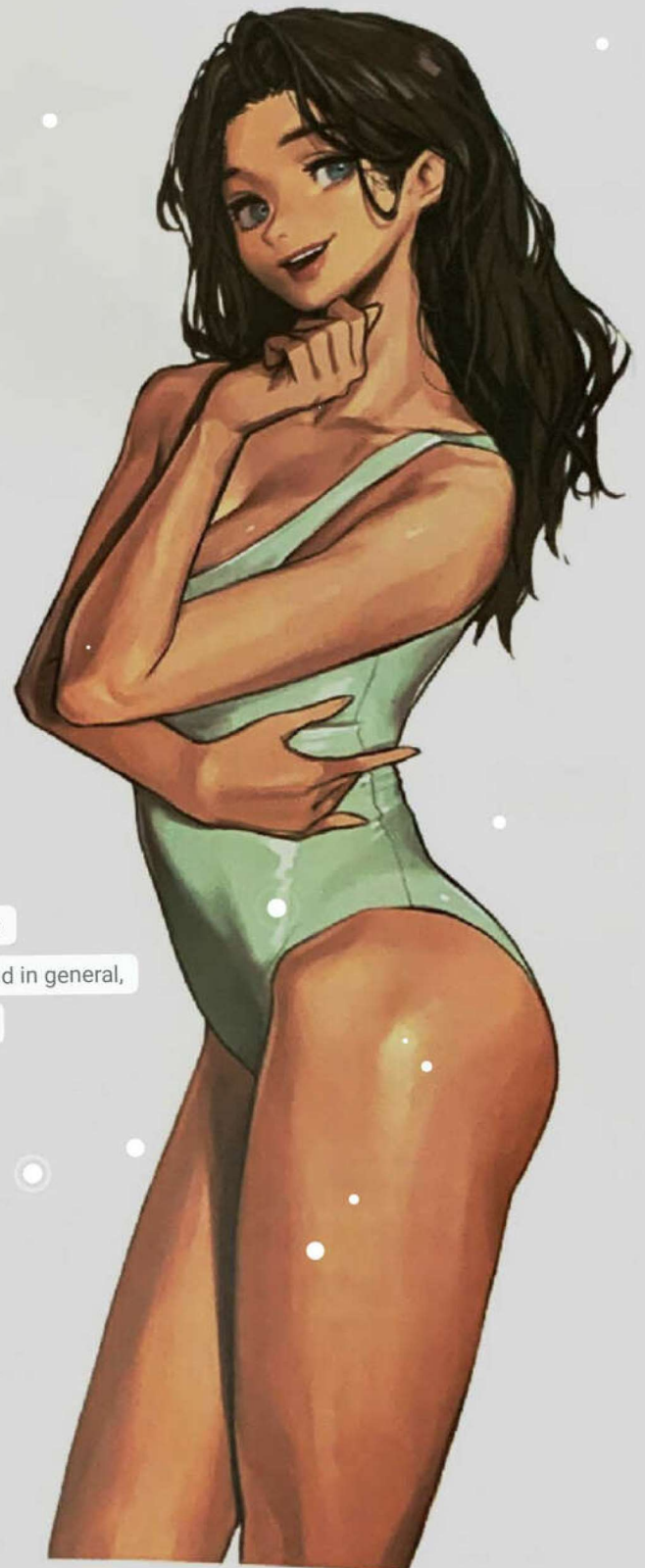
Diffuse reflection occurs in the human skin as well due

to minute curves, but it also has a different texture due to the fine

hairs of the epidermis, oil, and moisture. The smoother the texture, the

clearer the contrast between the highlights (specular) and the shadows, and in general,

this appearance is more common on hard objects than on soft textures.



However, the three-dimensional effect of the form is relatively unclear.



The criteria for distinguishing specular and

diffuse reflections are very blurry.

The sharper the specular object, the

less feeling of use and better for artificial texture

expression. By adjusting the degree of smooth

surface, you can express rich texture

even when drawing objects of the same color.

[Blur the specular as it diffuses and lower

the brightness slightly (by lowering the layer opacity)

) to show the light diffusion



Specul

blurred

M



### TIP

Color the base color of the diffusely reflective object brightly, and for the texture with specular reflection such as leather, color the base color a little darker.

The more vivid the

specular the material

is, the more it is affected

by the light source in coloring.







## Creating a surface texture brush

Objects that are touched with small curvatures on the surface can observe specular dispersion according to the curvature of the surface. When coloring these textures, it is effective to describe them so that the textures appear well in the regular. Let's see how to create a textured brush by applying a texture in the brush tool.

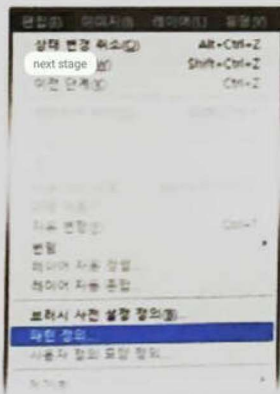
### ① Prepare an achromatic texture image.



Desaturate  
with GH+U.

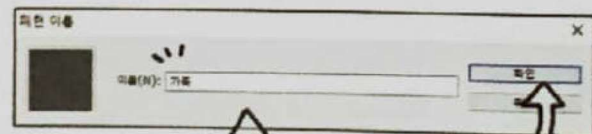


### 2 Save the image as a pattern using the edit pattern definition.



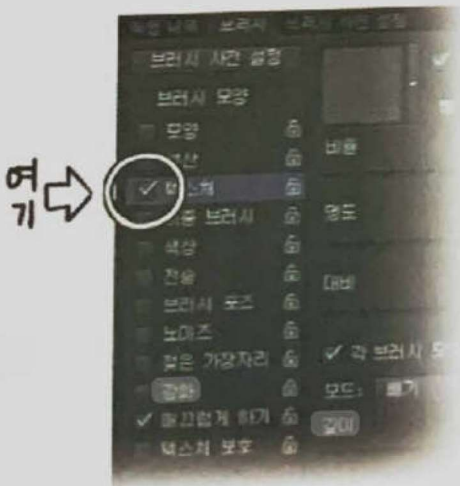
Alt+E

Save the current  
image in pattern format.



Name the pattern and save it!

### ③ In the brush settings, go to the texture item.

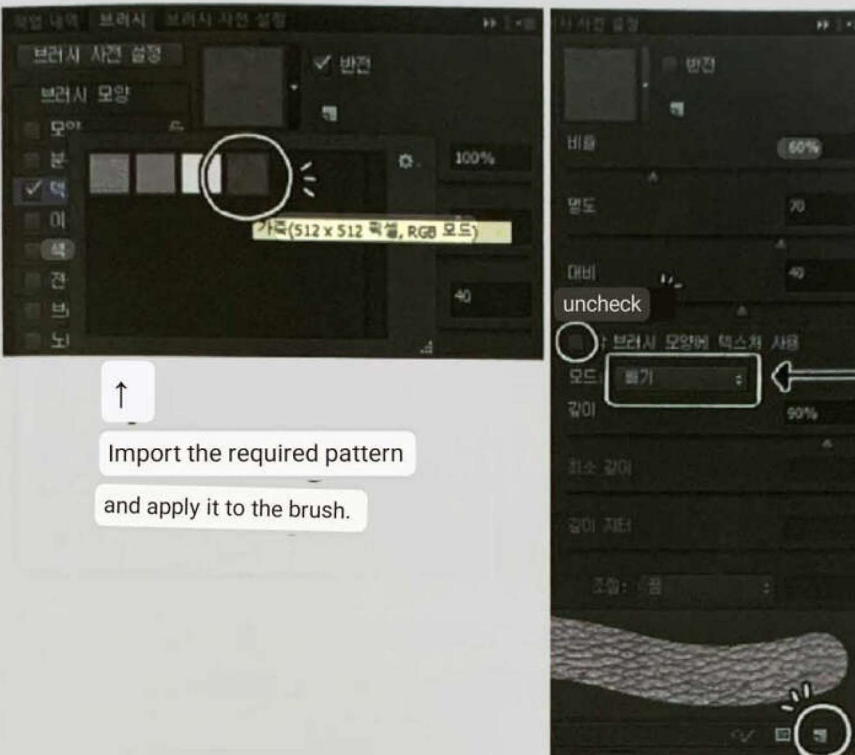


Shortcut for brush settings is FS

Other items of brush theory  
will be explored in 147 P.



④ Load the saved texture pattern, adjust the value, and save it.



↑  
Import the required pattern  
and apply it to the brush.

◆ Adjust the size ratio of the pattern.

◆ Adjust the brightness of the pattern.

◆ Adjust the contrast of brightness.

← Select multiplication/subtraction.

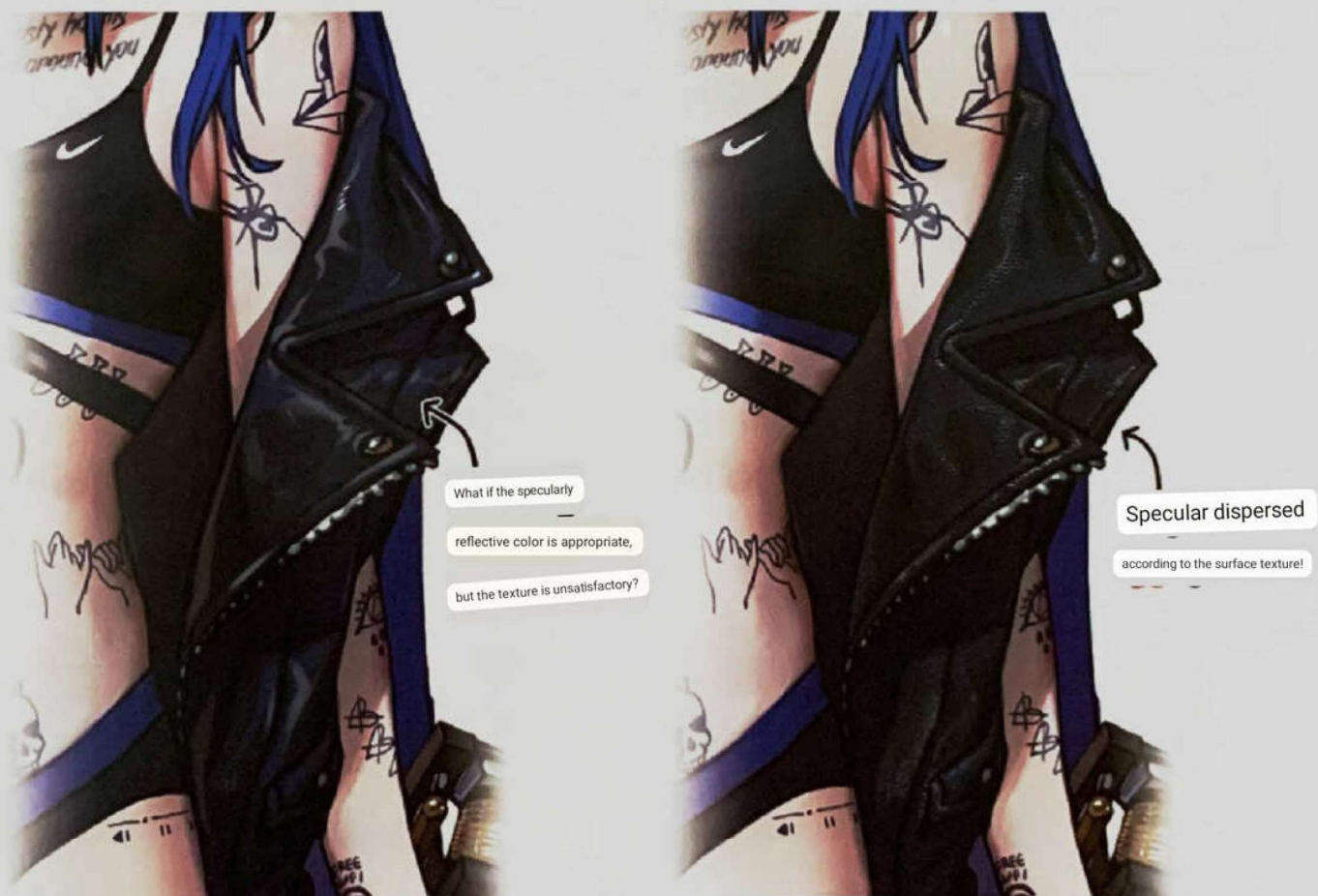
◆ Adjust the sharpness of the texture.

check the preview

← Save.

Try other items

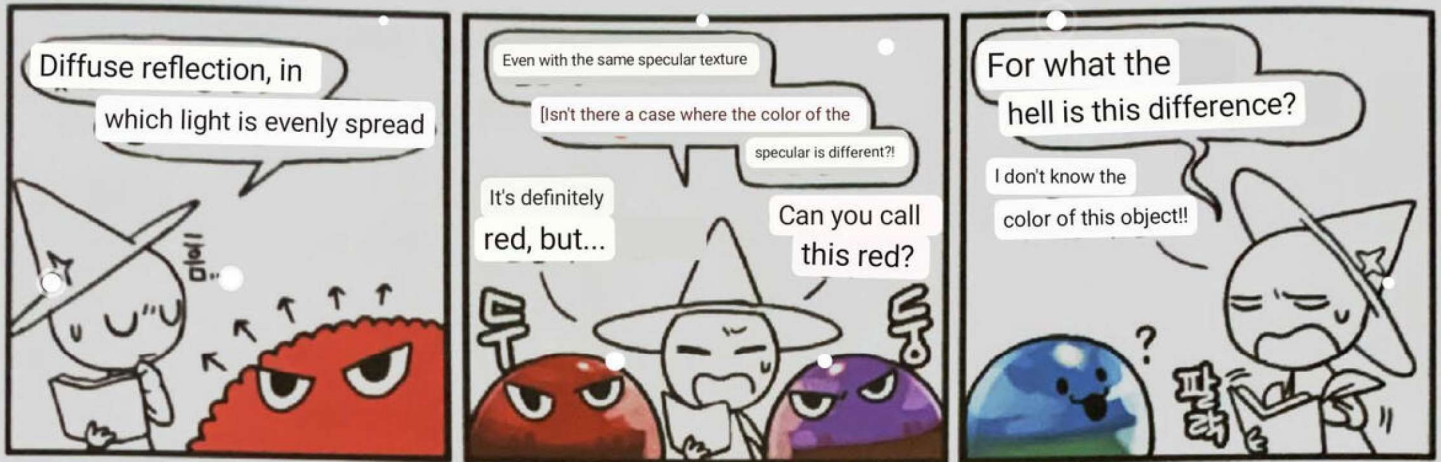
⑤ Use it as a brush to color the specular of the corresponding texture.



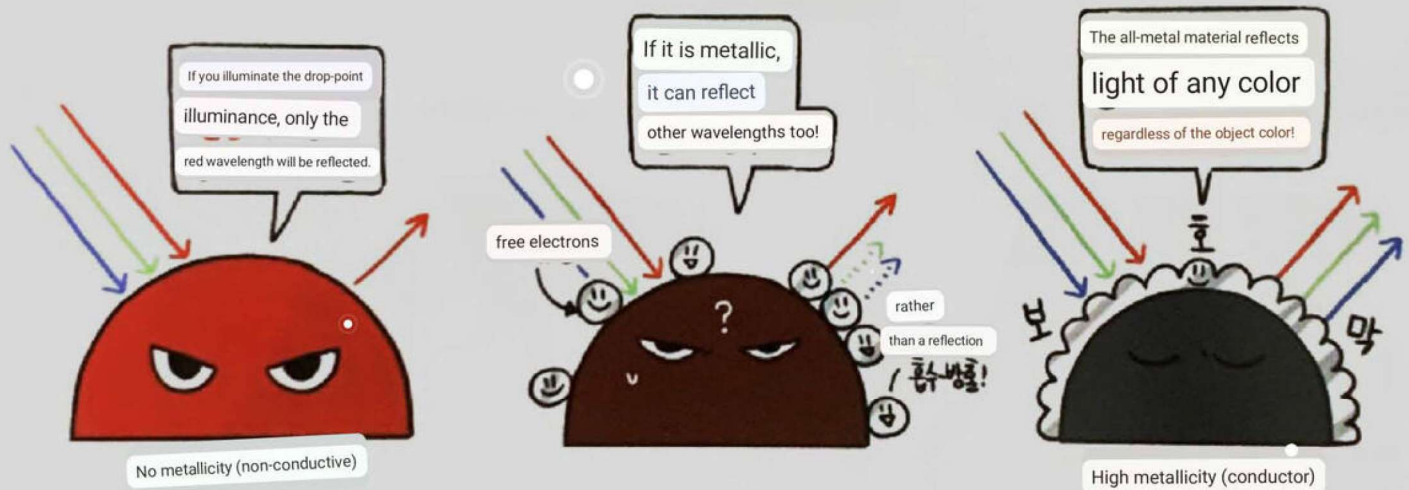


## 2. Material

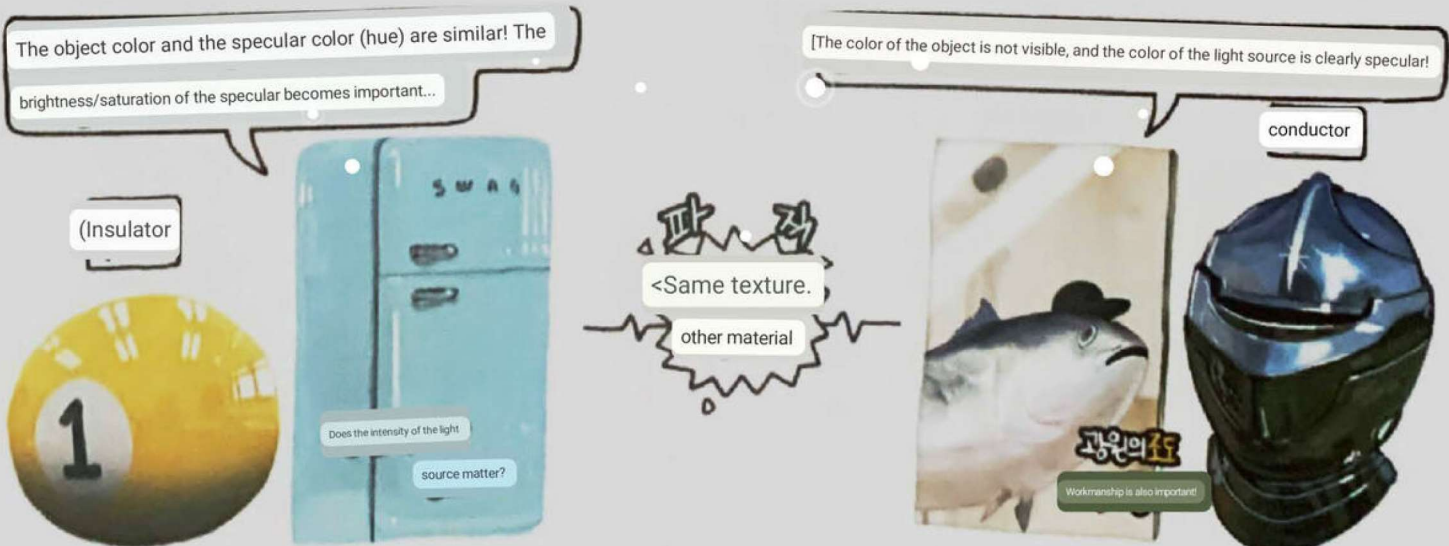
## ① metallic



Even for specularly reflective objects that accurately reflect light, the color of the reflected light varies depending on how much metal the material has. Metals can reflect light of all wavelengths due to the movement of free electrons, and this property is called metallic.

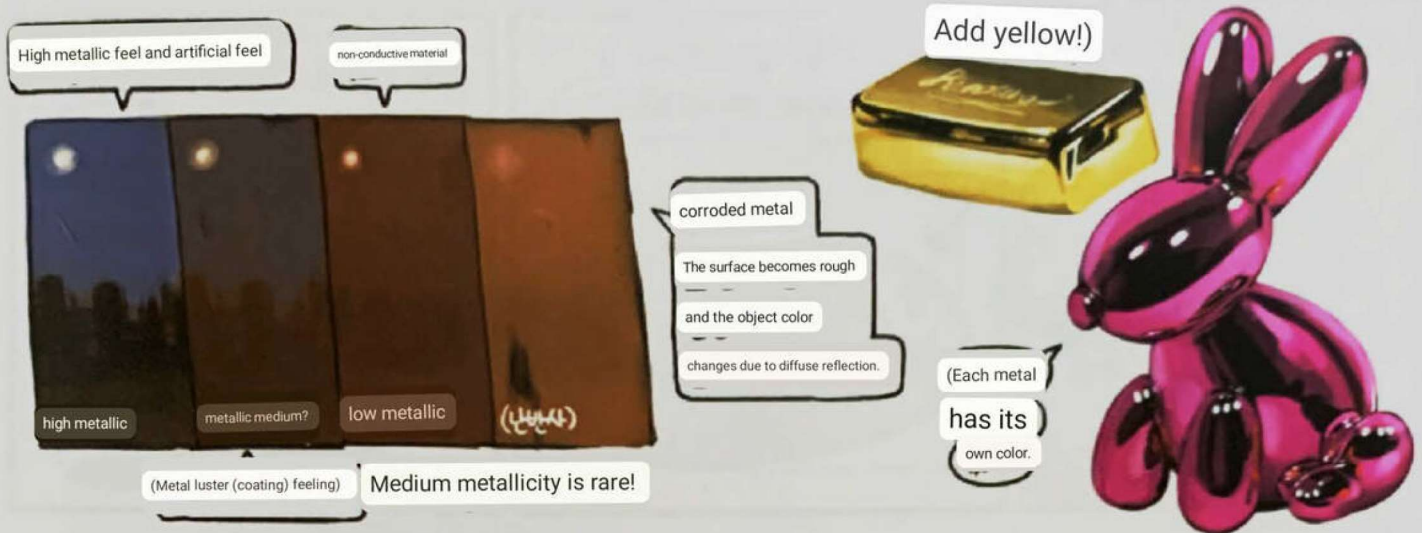


Objects that do not conduct electricity, such as wood and plastic, only have a difference in the brightness of the existing object's color in the specularum. Such objects are called insulators. However, highly metallic objects clearly reflect light of all colors due to the movement of free electrons. These objects are called conductors. In other words, the higher the metallicity, the less the color of the object appears and the color of the light source appears more clearly on the surface.

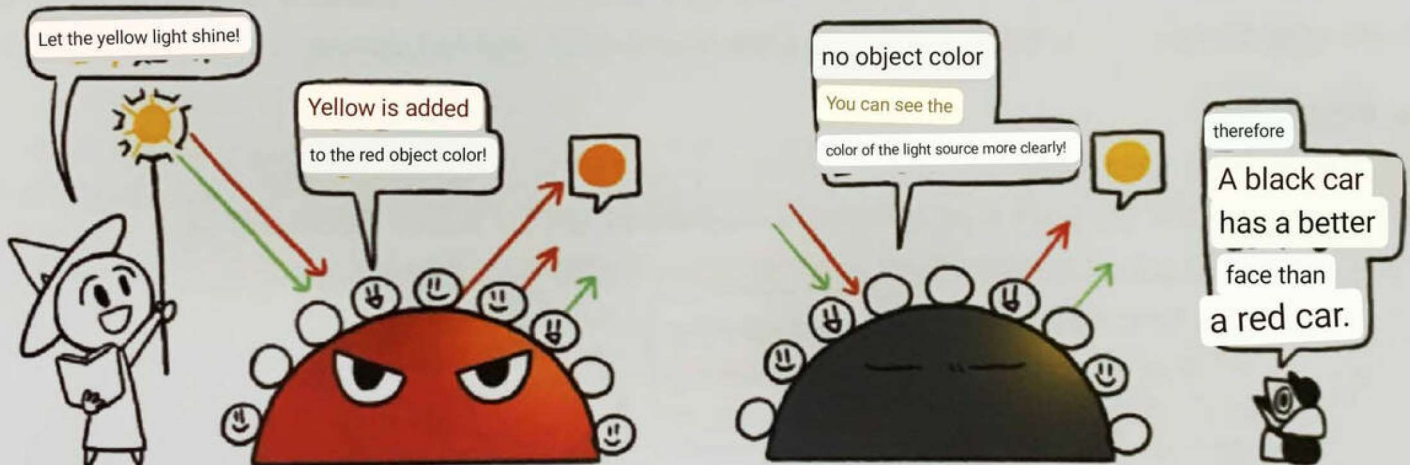




Certain colors are also reflected in the clear specular due to the influence of the metallicity of the object and the inherent color of the metal.



The less saturated and darker the color of the object, the more vivid the color of the specular.

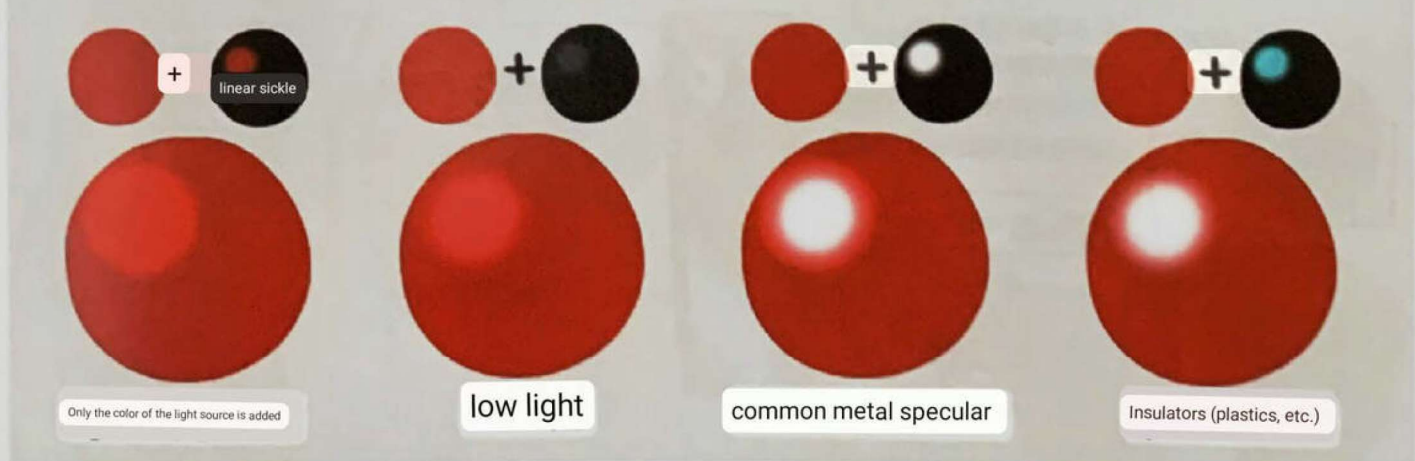


Let's paint the specular of the insulator with a complementary color

When expressing light shining on an object, linear dodge synthesis can be used to represent additive mixing. A metallic object that reflects

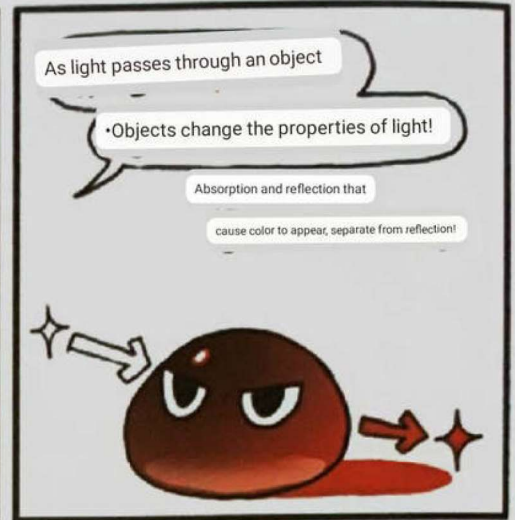
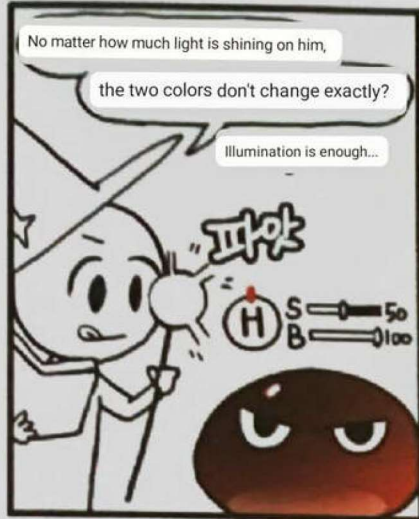
all colors can be synthesized using the color of the light source as it is, but in the case of an insulator, it must be synthesized by adjusting the color.

To depict a specular of the same color as the object color, the object color is subtracted from white light and the complementary color of the object color is synthesized with a linear dodge.





## ② 투과성(penetrability)



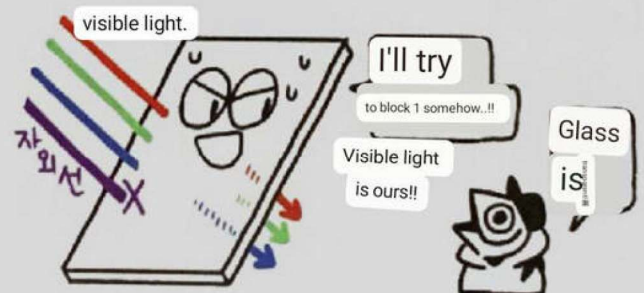
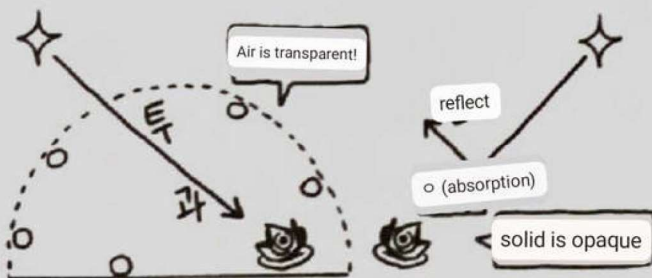
When an object absorbs and reflects certain wavelengths of light, it soon appears as

a color. Depending on the material or thickness of the object, the light incident on the object may pass through the object completely without being absorbed or reflected. The property of an object with this property is called penetrability, and the permeability differs depending on the material.

### ▶ Principle of Transparency

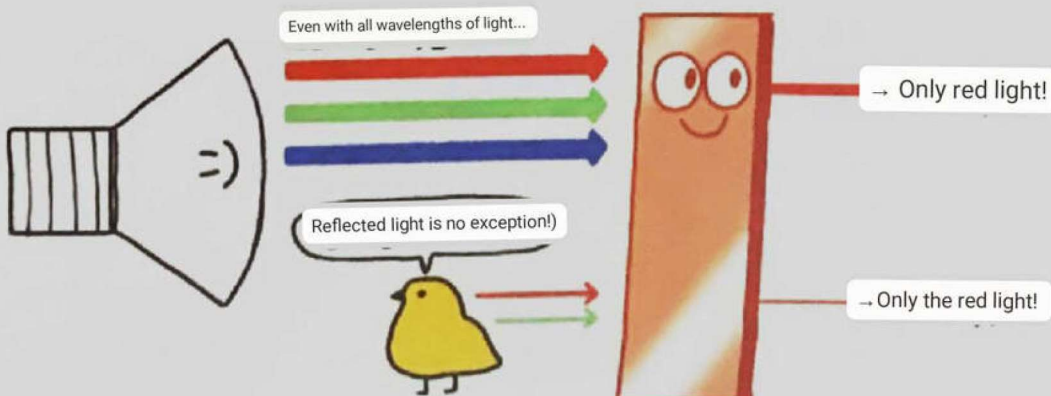
If the distance between molecules forming a substance is tight, light absorption or reflection occurs and a specific color appears on the object. looks good

Some substances do not react with the wavelength of visible light, in which case light (visible light) passes through the object and appears transparent.



### ▶ Transparent color

When an object transmits all wavelengths of light, it becomes transparent, but when only a specific wavelength is transmitted, the color of the light changes, which is called transmitted color.



## ► Scattering

When light exits through a transmissive object, it refracts at irregular angles and scatters widely. If the thickness of the object is thick or the transmittance is low, it is scattered more strongly, and the transmitted light is spread widely.



## 3. Layered material

Since the permeability of a material is not a property that appears on the surface of an object, the specularity of the surface of an object appears according to the texture and metallicity of the surface.

Objects that display more than one material like this are called layered materials.

Many objects in the world have these materials. Typically, human skin is also a complex layered material.





## PART 05

phenomenon

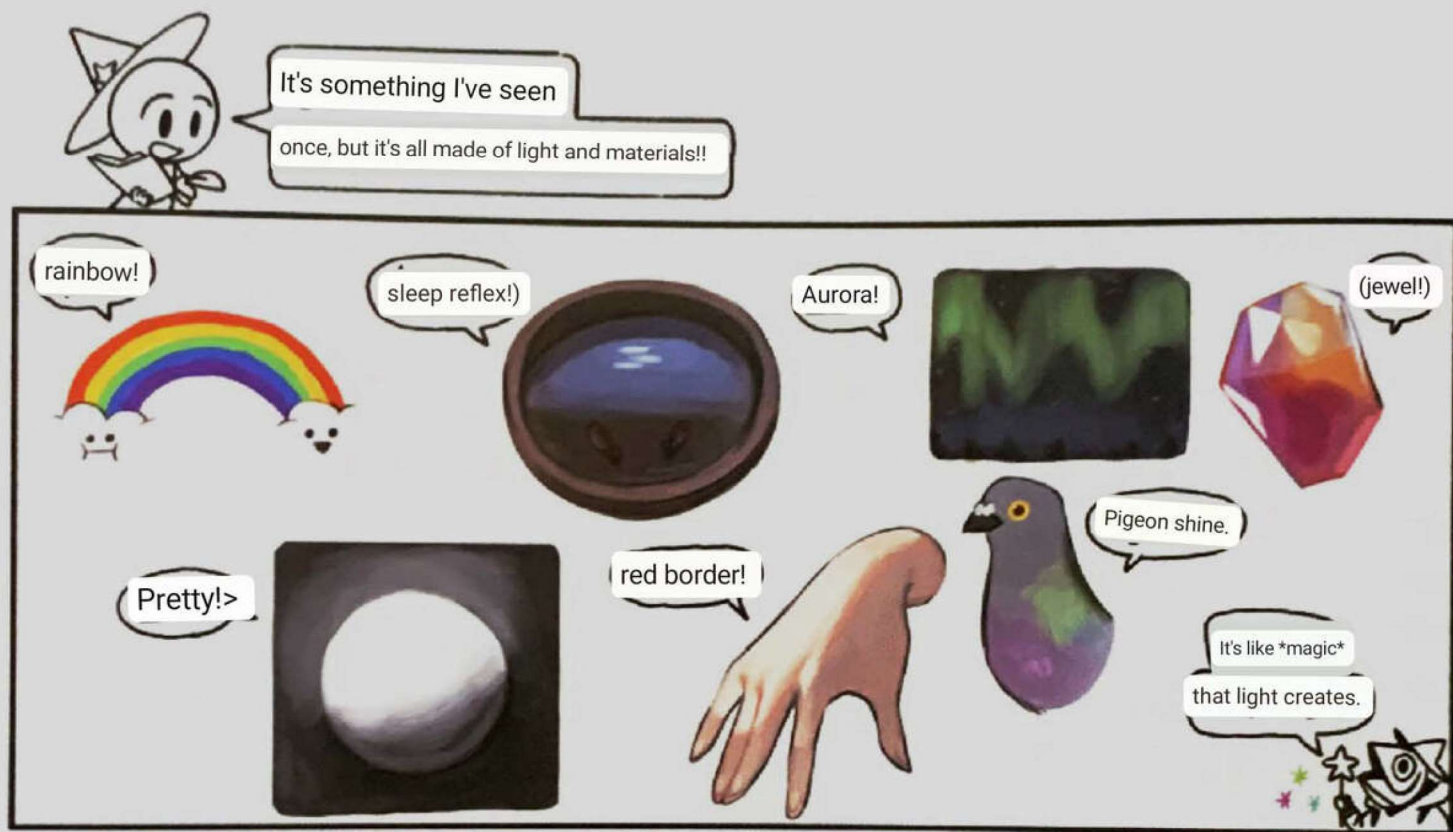


# 1\_Effects&Phenomena

Various optical phenomena appear due to the interaction of light and materials as we saw earlier. From the rainbow created by the sun and water droplets to the brilliant colors of jewels, you can observe this phenomenon in a variety of places.

When you color the world, you can make a more realistic expression by using various phenomena. Also,

some phenomena can be observed under very rare circumstances, which can be used to create fantastical appearances.



It is good to express wonderful phenomena in appropriate situations, but it is also used exceptionally for effective production of creations.



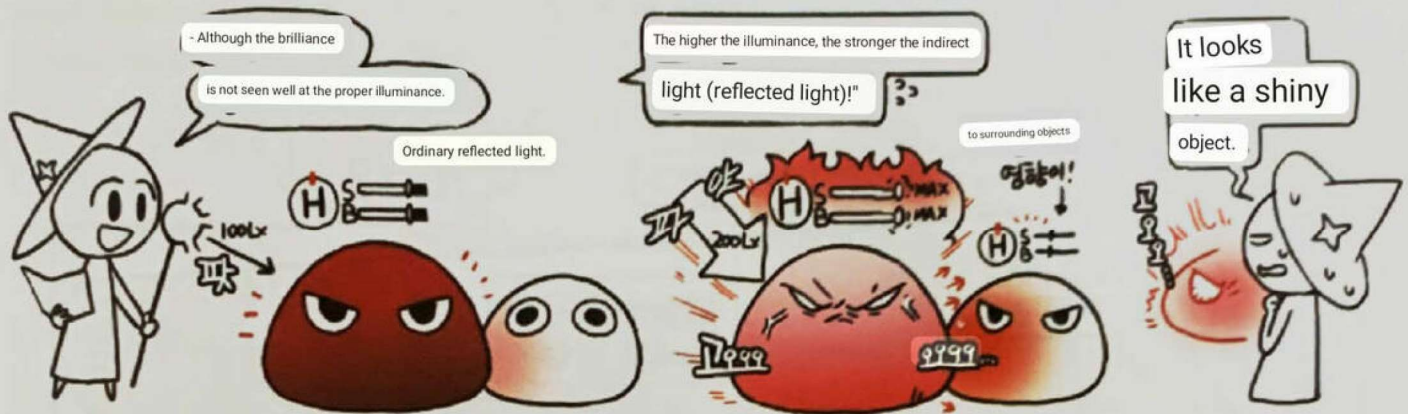
If you color too faithfully to the principle, you cannot express the originality of the painting, so it can be used as a seasoning!



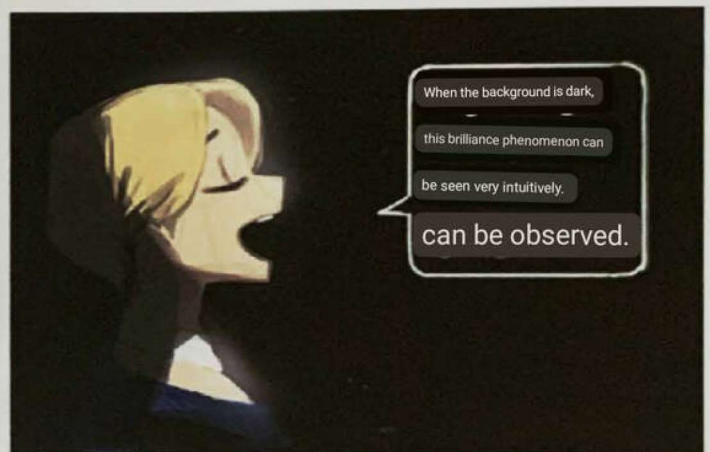


## 1. Radiance

When an object exposed to strong light appears to emit light by itself while reflecting the light clearly, it is called radiance. All colored objects reflect light at least weakly, but it is rare for a reflected light to have a strong impact on the environment. If the light and color that an object reflects becomes clearer than necessary, the object color or light appears in the surrounding environment as well. When the illuminance of the main light source is very high, the brilliance can be easily observed when all indirect light, including reflected light, becomes clear.



When objects of the same color are close to each other, the colors become more vivid and the characters appear shining on stage.



Luminescence is often used to maximize the appearance of light in strong illuminance or highlights of brightly colored objects.



To emphasize the role of rimlights or make white objects brighter...

The color of the object around the object

Composite with screen or

soft light!!

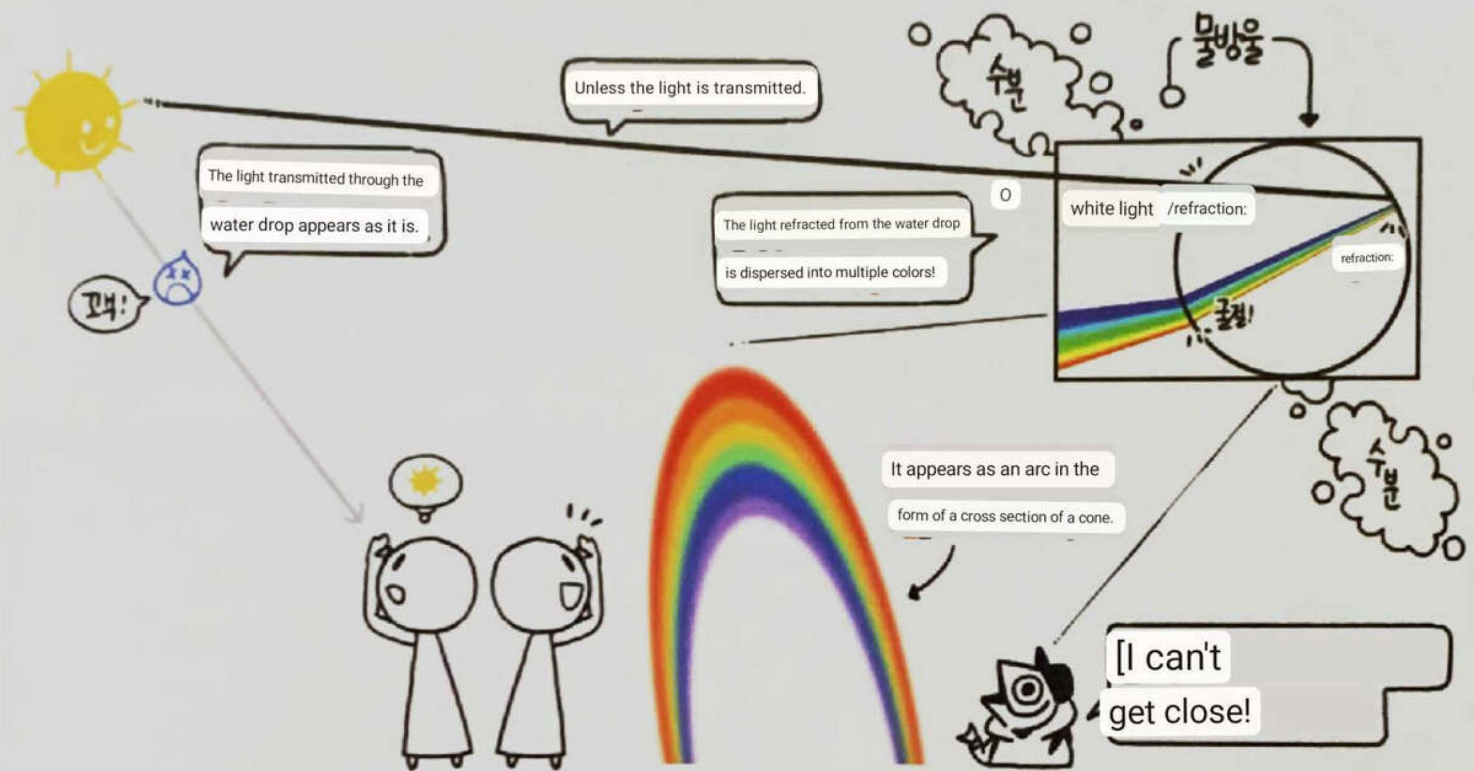
Airbrush recommended!!



## 2. Rainbow and rainbow colors

## 2-1. rainbow

You may have seen rainbows arcing in the sky after rain. The rainbow is one of the representative natural optical phenomena. A rainbow appears as an arc with a continuous red-violet color spectrum. As white sunlight is refracted in water droplets in the air, it is dispersed into various colors of light, and when conditions are met, it can be created in artificial environments such as sprinklers.



As a rainbow is a phenomenon that is not a material, it is often used in fantasy productions because of the fact that it is permanently physically inaccessible beyond a certain distance from the observer and that it can only be observed with the back of the light source under certain circumstances.



## 2-2 iridescence

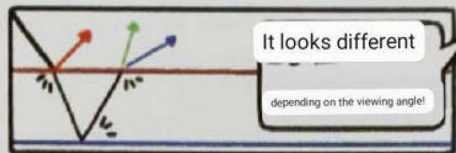
Light usually has one color, but soap bubbles and abalone shells have indescribably colorful colors. When light is diffracted from a very thin film, etc., it takes on different colors depending on the viewing angle, which is called iridescence. Complete iridescent colors are rare in nature, but due to this phenomenon, animals with two or three colors are more common than you might think. Structural factors with pigments and colors caused by light diffraction are called structural colors, and they can be easily found in natural objects.

When light is reflected from a normal surface,

the color is determined by the color of the object, but due to diffraction of light, different wavelengths are reflected.



The top and bottom of a very thin film



The structural color of the blue

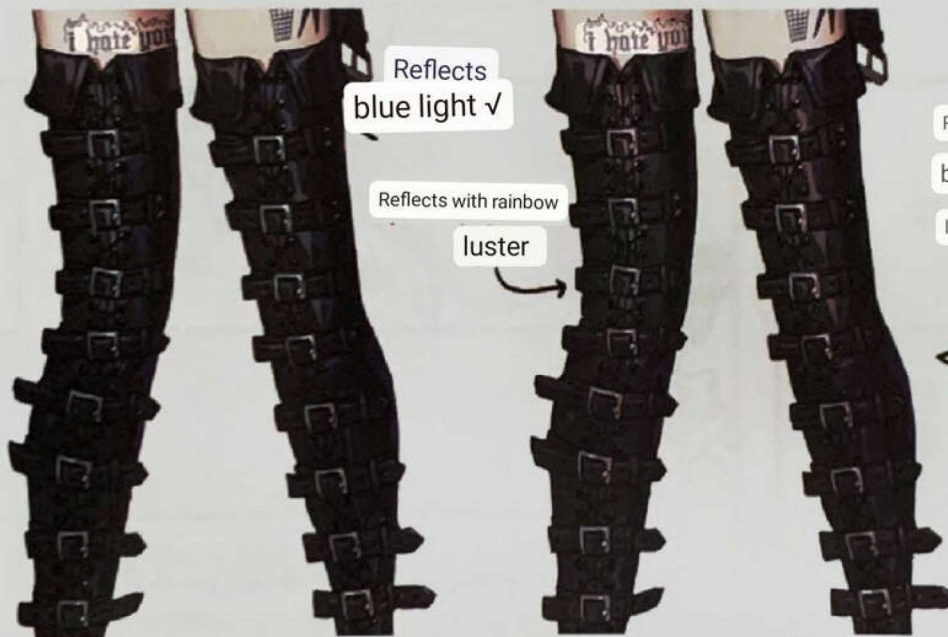
feather is tinted by light diffraction!



You don't need to know when to color.



1) Diffraction: A phenomenon in which the refractive index of light is different for each monochromatic light. For this reason, the color may be different depending on the viewing angle.



Rainbow colors can only be seen in certain materials, but by reflecting them on ordinary luster, you can create a mysterious and rare feeling.

Works great on achromatic objects!



Are blue animals rare in nature?

Most blue animals have blue as their structural color, even if they are not brightly colored, such as silkworms and hummingbirds. Animal pigments are usually concentrated on the skin, so the blue color that appears on fur or feathers other than the skin is often a structural color.



butterfly



bird



iris



Ring octopus...

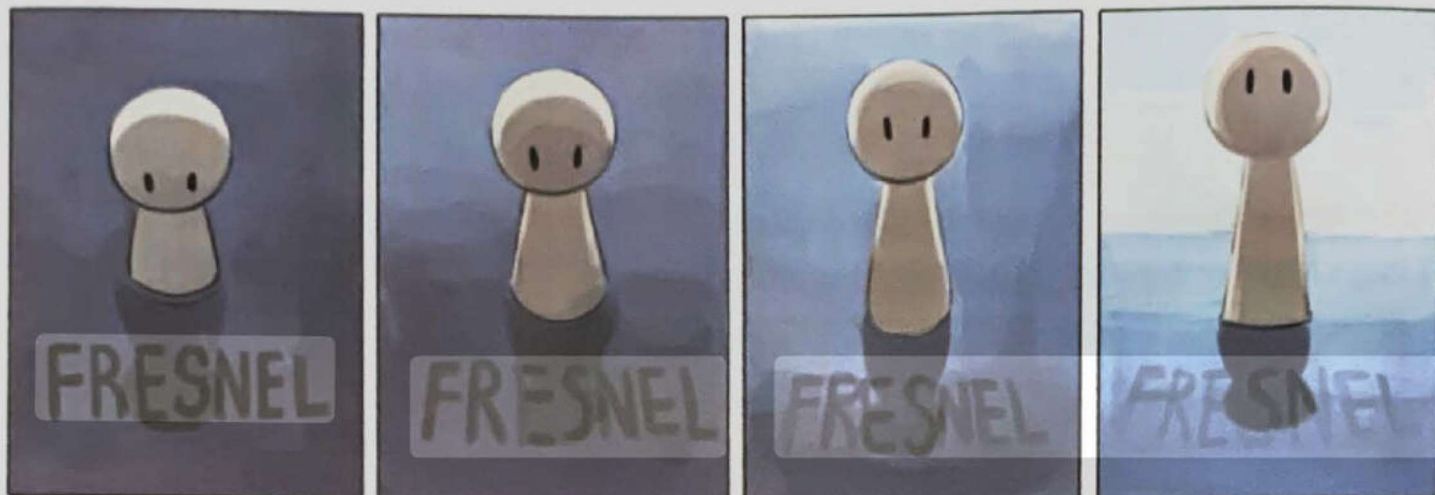
The only vertebrates with blue cows?



blue poison arrow frog

"Hmm... fake girls."

### 3. Fresnel Effect

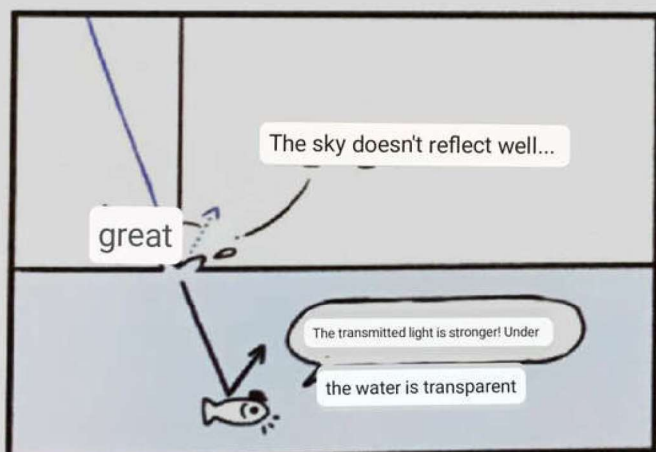


If you look down from above on a clear water surface, your feet can see clearly below the water surface, but the farther away you are from the

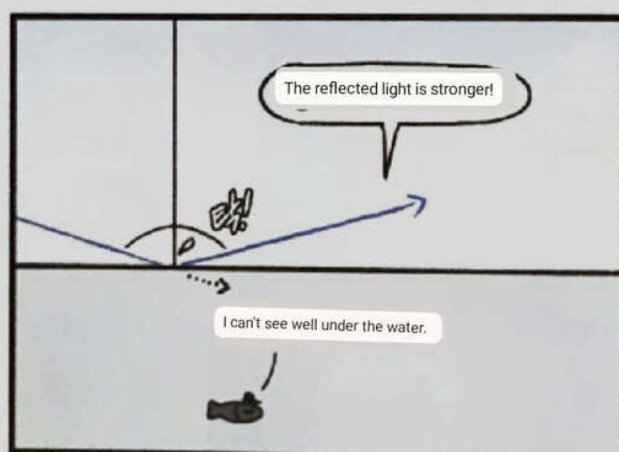
view, the more the reflection of the water becomes more pronounced. When light reaches a transmissive object, the reflectance and transmittance of the same light are

different depending on the angle at which the light shines and the angle at which it is reflected. As the light enters vertically, the transmittance increases so

that the bottom of the water can be seen. This formula is called the fresnel effect, after the person who discovered it.



the amount of  
incident light is  
the same



As the distance between the observer and the surface of the water increases, you will see the

surface of the water at an angle, so you can observe the reflection of the sky or environment on the far surface

of the water. Shadows or reflections of black objects appear below the surface of the water.

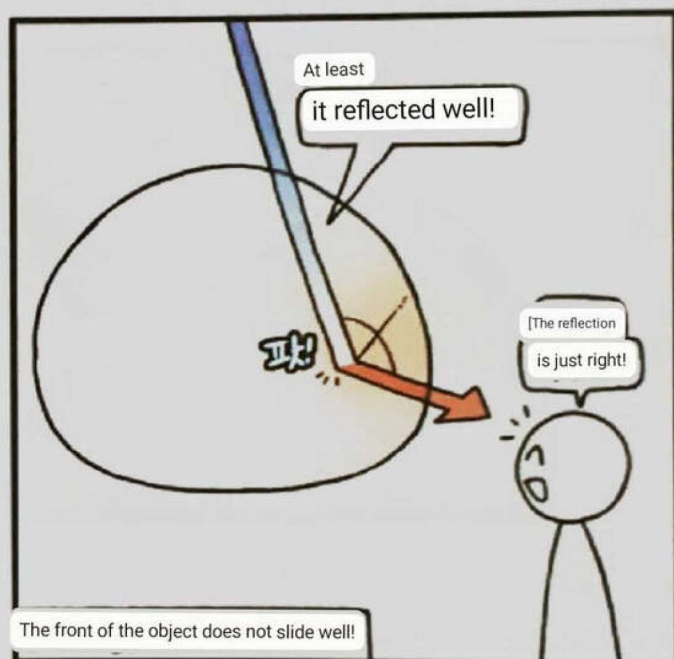
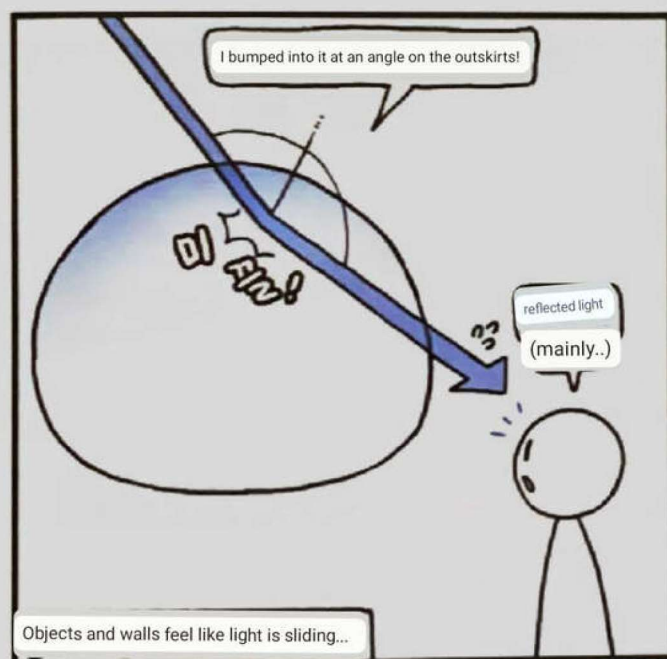




## 3-1. Applying the Fresnel effect to an object



In addition to the perspective effect in space, the Fresnel effect can also be found when observing the exterior of a three-dimensional object. Light shining on the front of a spherical object is reflected vertically to the eye, and the same light is reflected at a more oblique angle from the side. You can.



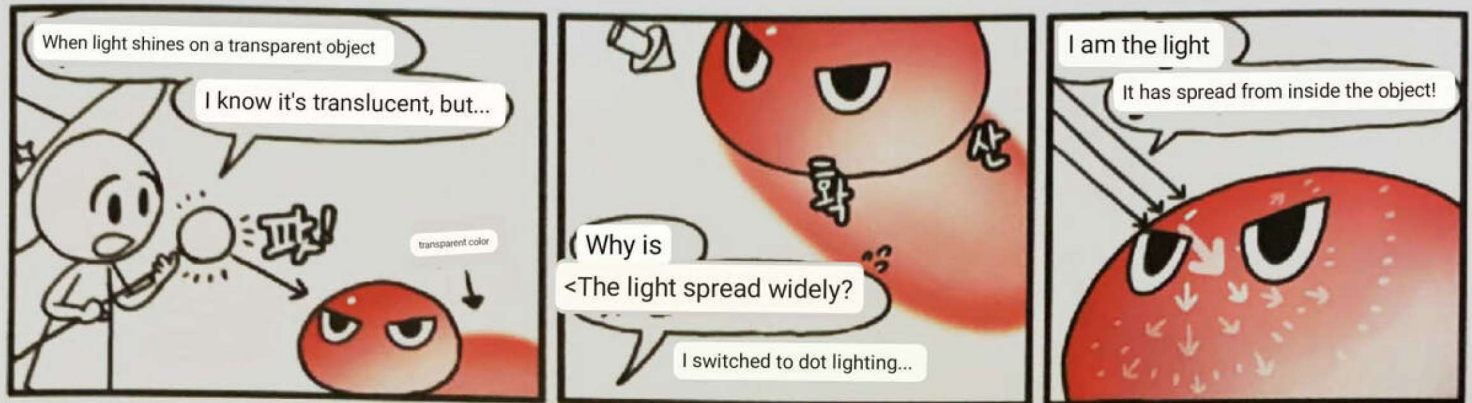
In some cases, rimlight lighting is installed to separate objects from the background in the picture. In addition to illuminating an object with strong backlight, a method is also used to maximize the reflection of light on the outside of the object by applying the Fresnel effect.

[When coloring metal materials.

Try using it (color dodge synthesis)



## 4. Sub Surface Scattering (SSS)

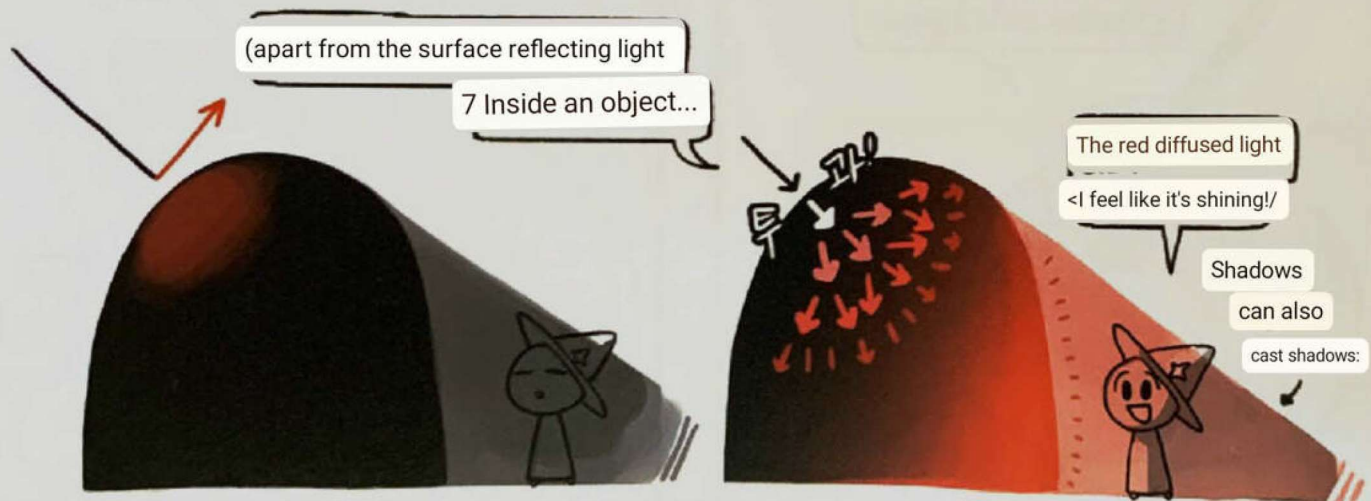


When light passing through an object escapes to another location, it spreads brightly and diffuses inside the object, which is called subsurface scattering.

When light scatters at irregular angles below the surface of an object, the transmitted color appears clearly in the object's shadow. The brightness

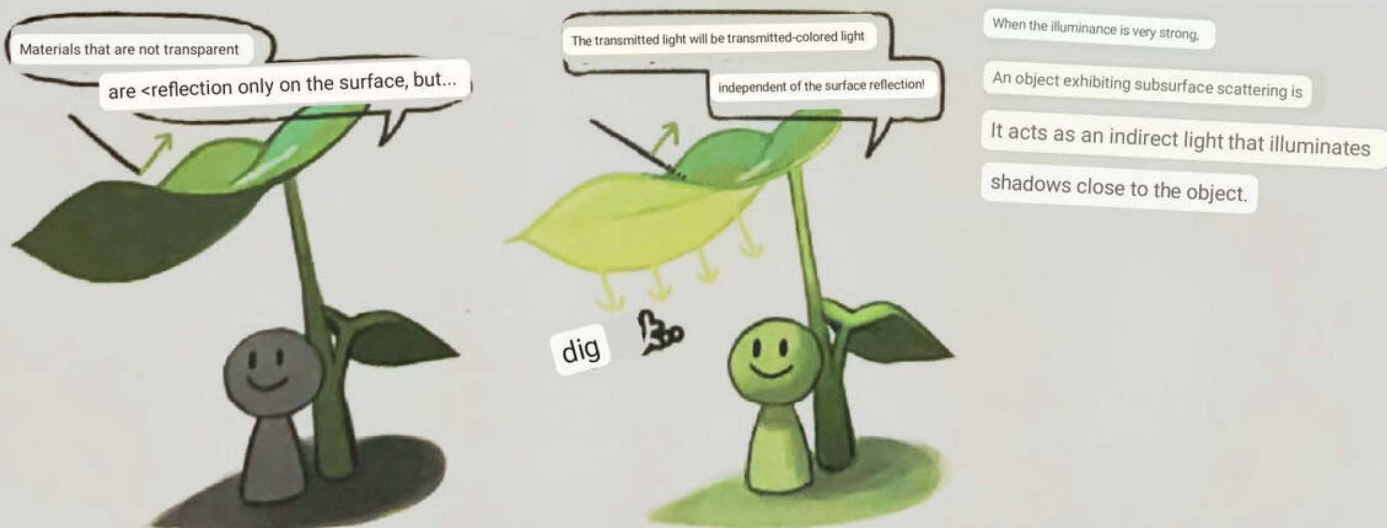
of the scattered light also varies depending on the illuminance of the light or the thickness of the material, and this phenomenon occurs in many layered materials.

### 4-1. subsurface scattering in the shade



When light transmitted through an object is diffused inside, the object diffuses and emits light as if it were self-luminous. It can be

observed that the transmitted color of the object is diffused and illuminated in the shade where the object cannot be illuminated by the main light source.





## 4-2 Subsurface Scattering Appearing in Shape Shadows



In a layered material, the reflected light from the surface and the diffused light of subsurface scattering have a complex effect on the color of the object.

Since the highlights are sufficiently brightened by the main light source, the transmitted color of subsurface scattering does not appear directly. The light

of the transmitted color stands out more than the effect of the main light source at the contrast boundary and shadow where the object color does not appear relatively well.



Human skin is one of the representative layered materials, and subsurface scattering can be observed when strong light is irradiated onto the skin. In addition to the

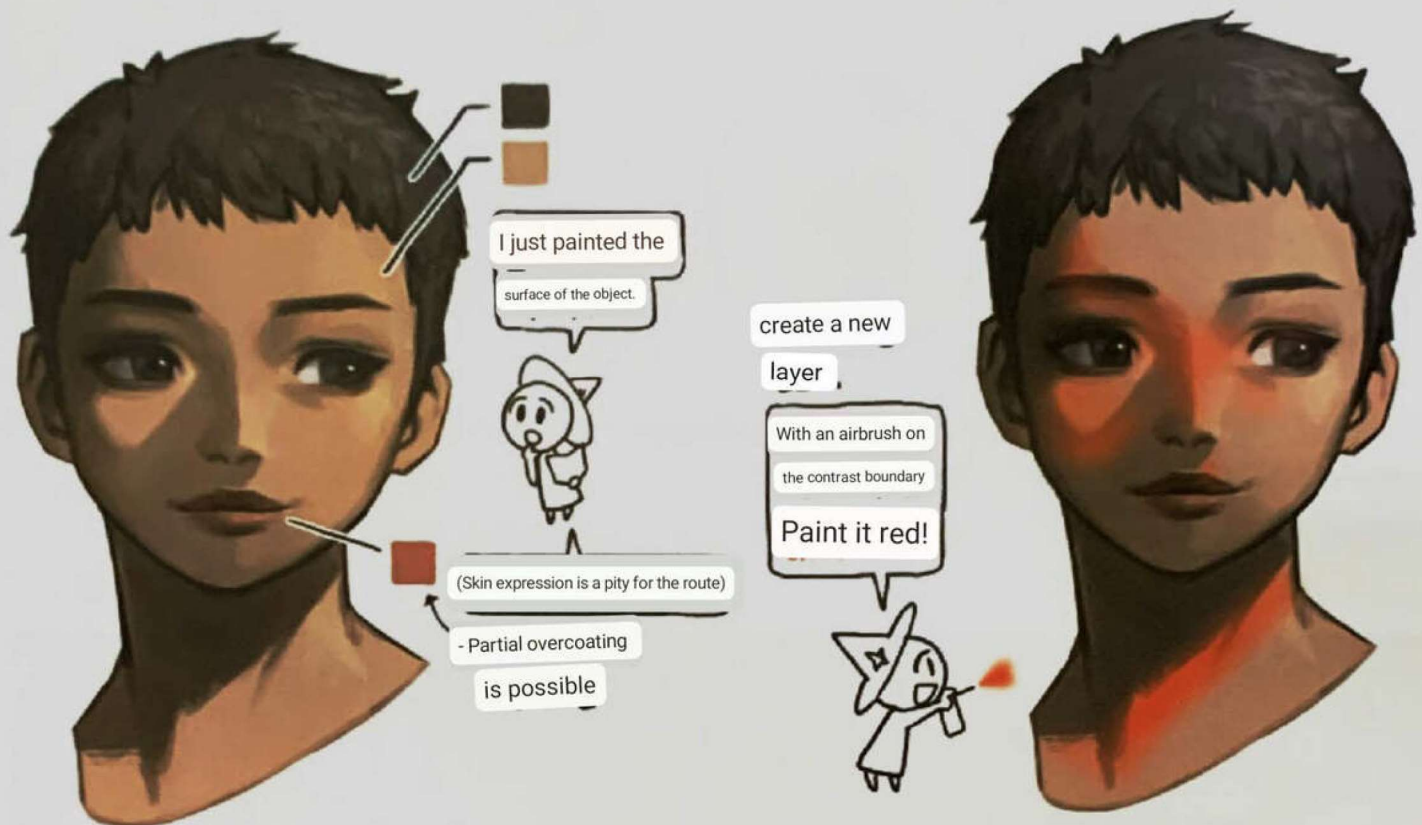
effect of illumination, a red color appears in the shape shadow or the contrast boundary depending on the color and thickness of the skin and the amount of

blood flow. Subsurface scattering is a phenomenon that occurs well when the conditions of roughness and material are met, so it is very often used when coloring human skin.

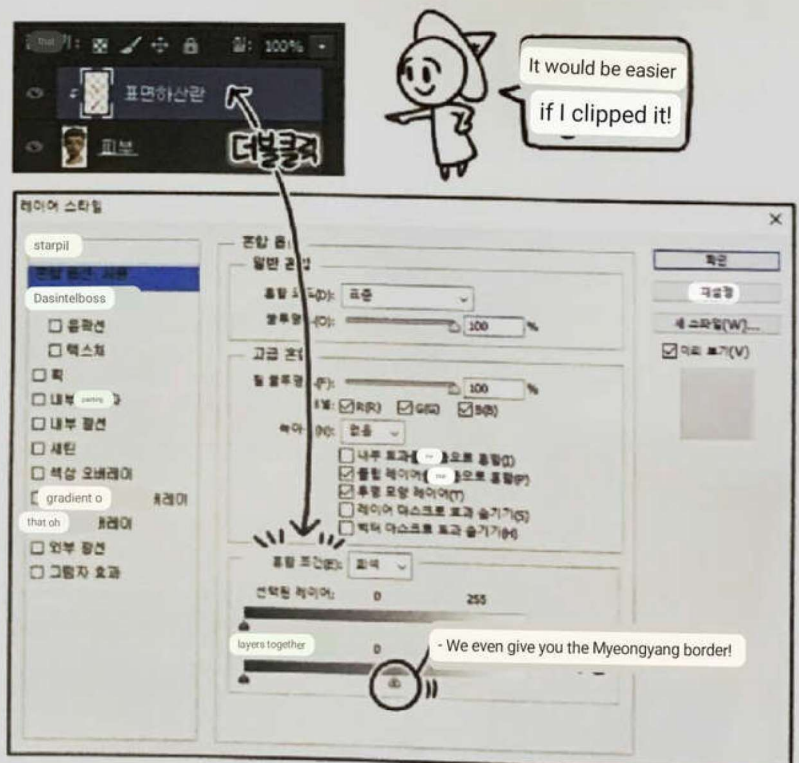
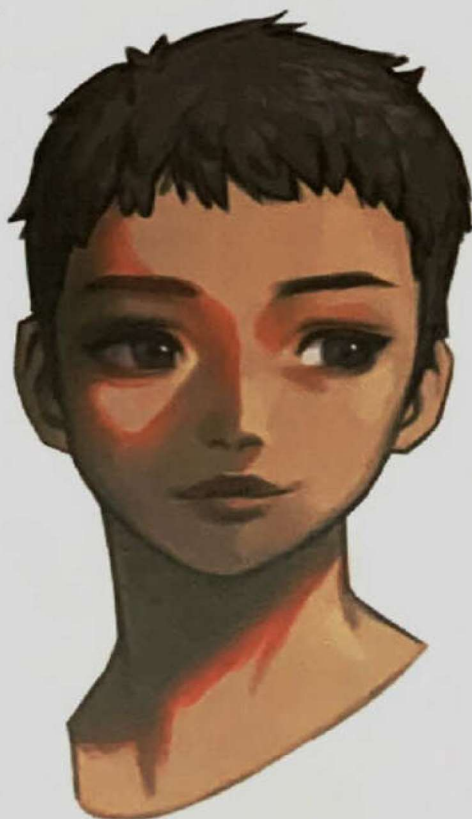


## ► Compositing subsurface scattering with layer blending conditions

It is very effective to show subsurface scattering of the skin when expressing lively skin. Let's use the layer blending condition to easily synthesize the red light that appears at the light and dark boundary.

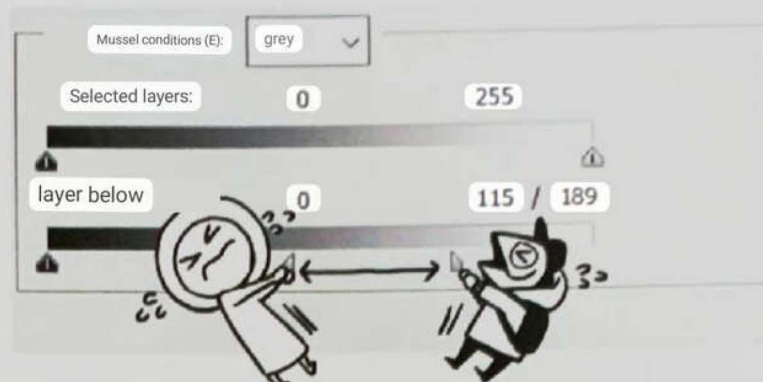
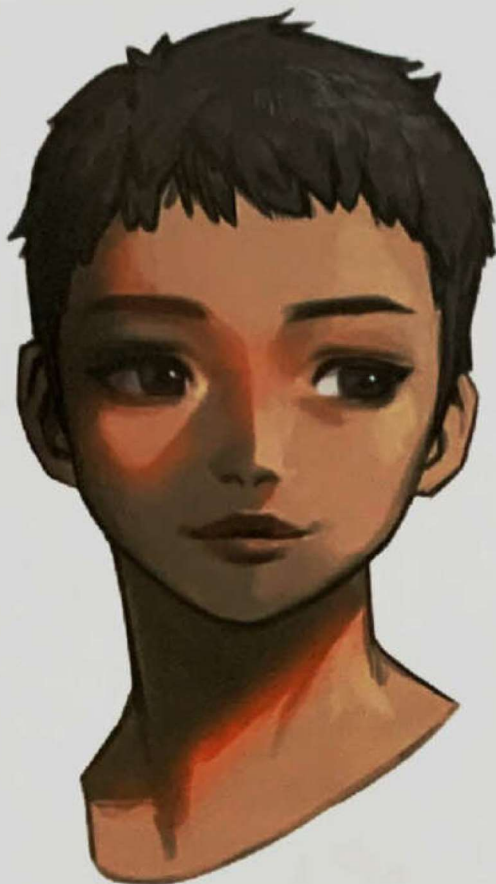


Since the glazing coloring method synthesizes only the color that appears on the surface of the object, the color caused by subsurface scattering must be additionally described. Create a new layer for compositing and softly paint the red color on the light and dark borders.



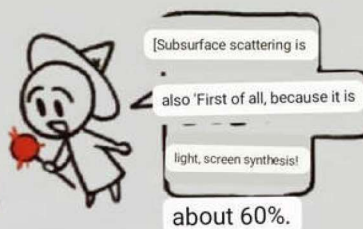
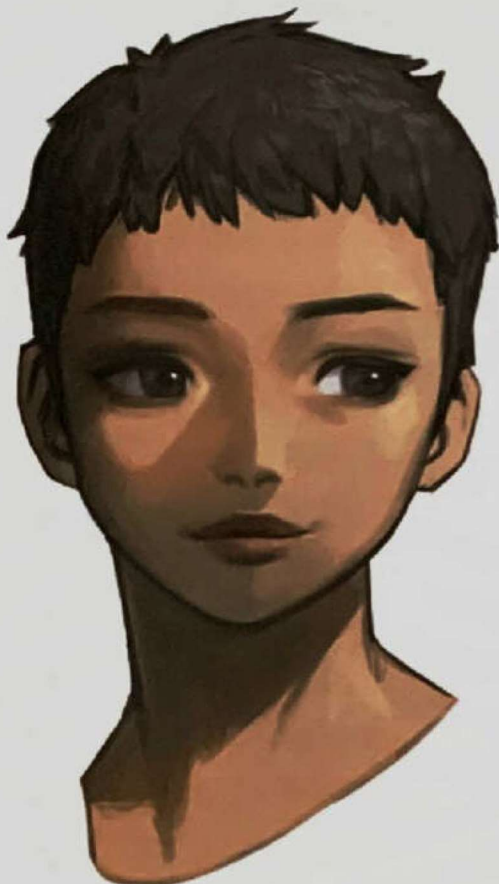
In the blending condition of the layer for compositing, move the slider of the layer gradation below so that the highlights do not appear.





Detach the slider by  
holding down the Alt+ key!

At this time, hold down the Alt key and move the slider to make the compositing smoother.



The layer blending condition  
is a method that  
is used in various places  
besides subsurface scattering!

Tattoos,  
rainbow colors, etc... ○



Subsurface scattering can be expressed by compositing layers as screens or overlays.

Adjust the layer opacity to express the red color without being too excessive.

## PART 06

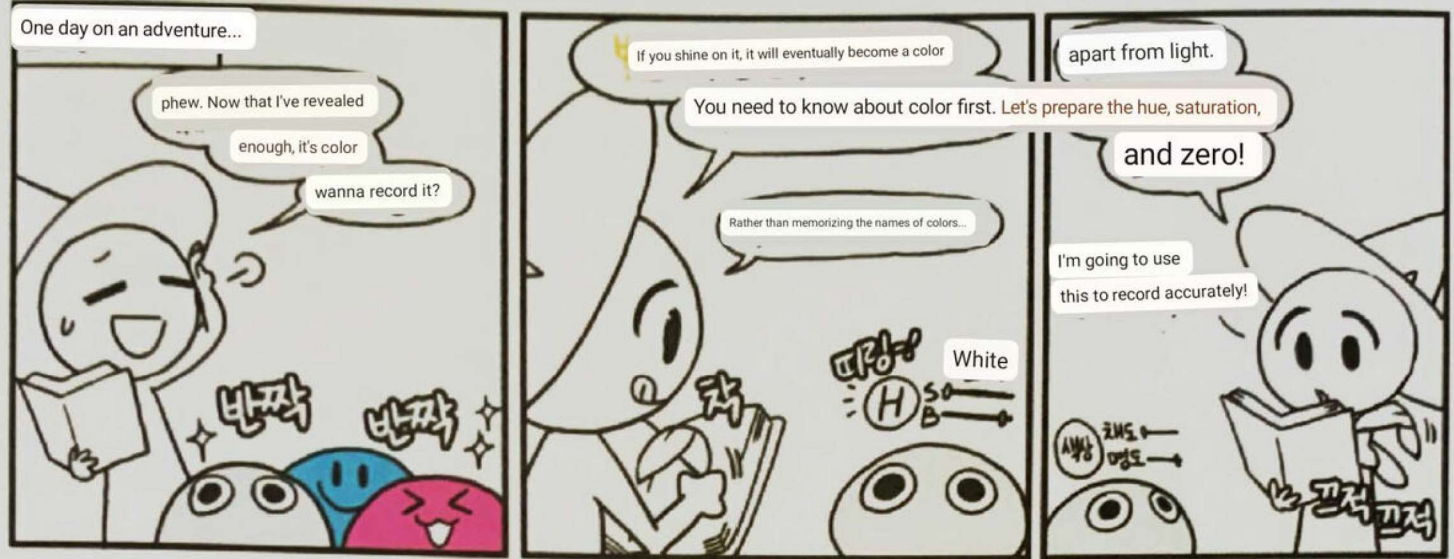
color



HERE ON

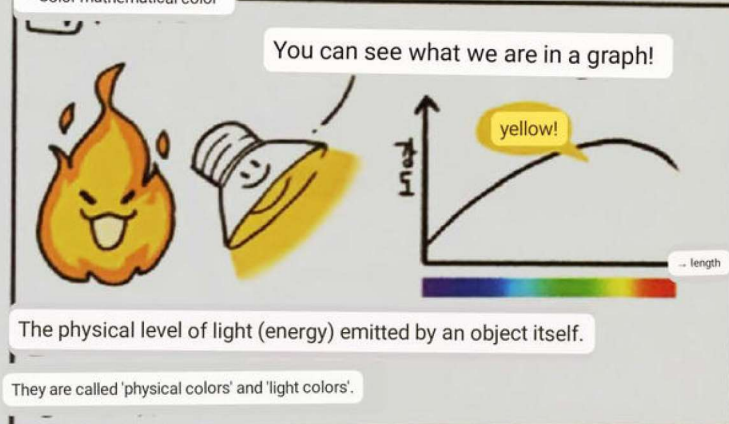


## 1\_Color

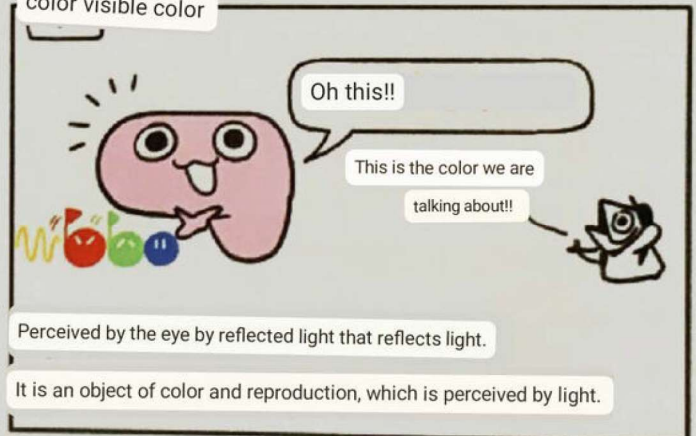


When light illuminates the world, we perceive it as a color. Color is a subjective sensation that does not exist physically in reality. An image that expresses the appearance under the influence of light with accurate colors can effectively reproduce the intangible existence of light. Color is used in various meanings in some cases. Let's compare the definitions of some colors you need to know for coloring.

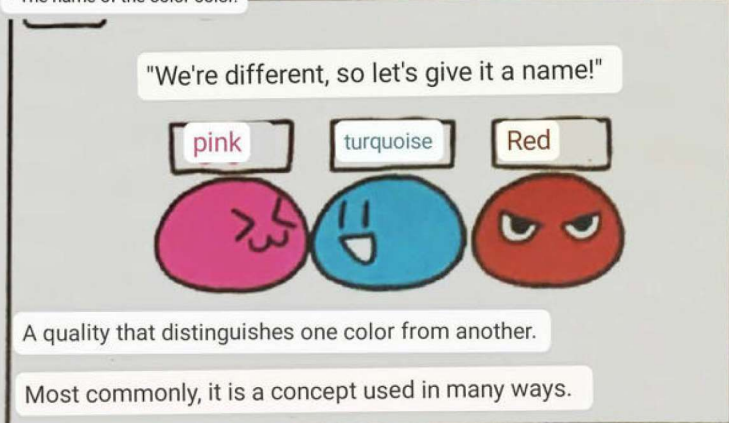
## • Color mathematical color



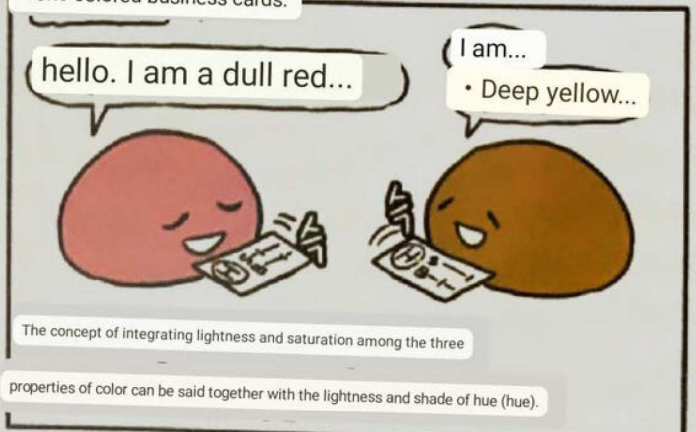
## color visible color



## - The name of the color color.



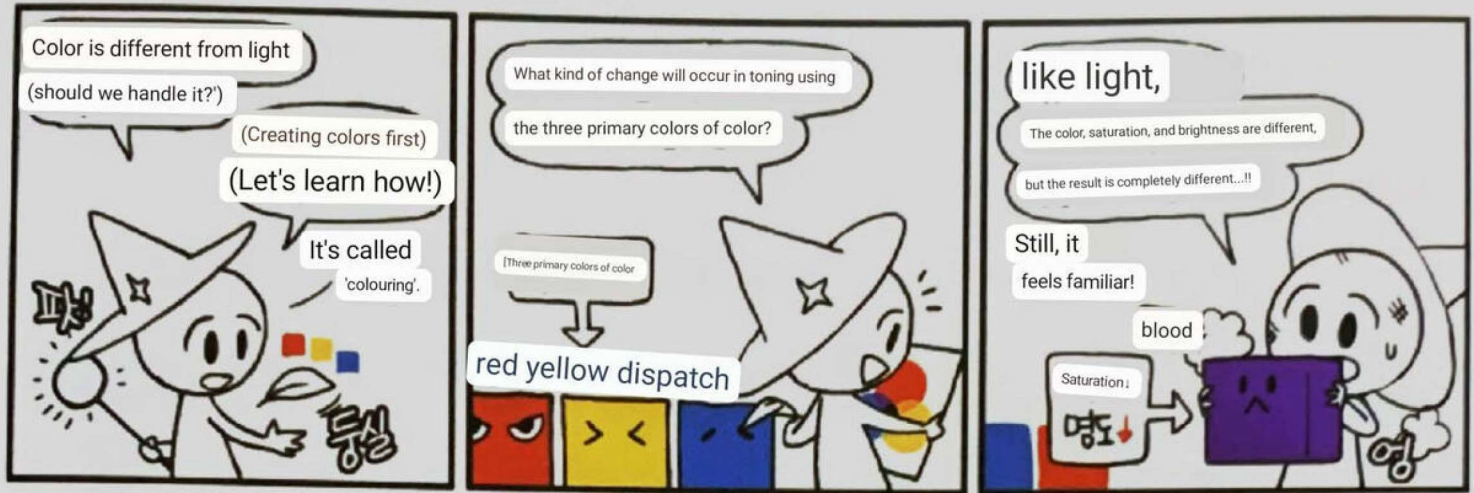
## -Tone colored business cards.



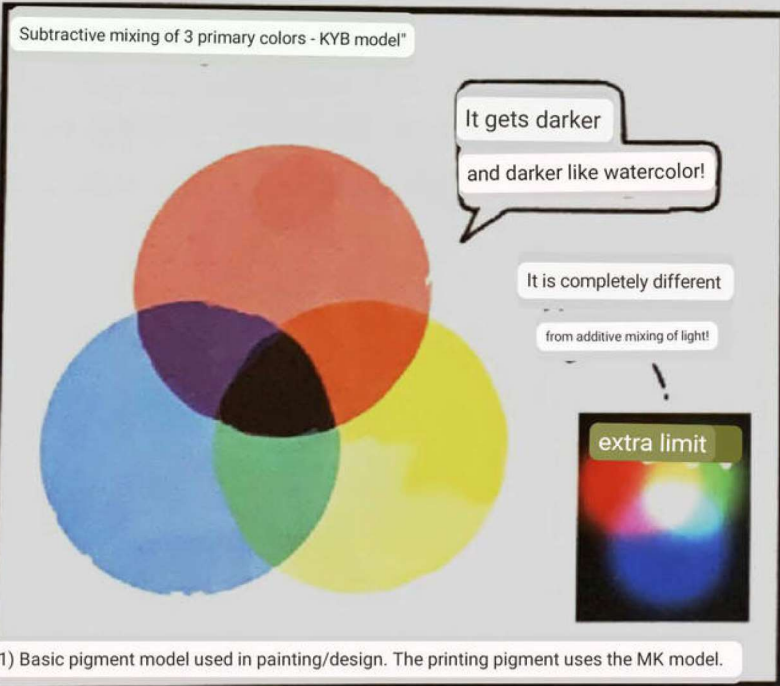
In other words, the color required for coloring is the most accurate expression of color, but we will call it a color intuitively.



# 1. 조색(Color Mixing)



Coloring a picture to express the appearance of an object is called coloring, and creating such a color is called toning. Toning involves combining pigments to create a desired color. Unlike light that is added and mixed, subtractive mixing occurs in toning. Let's see how the color properties change when subtractive mixing is used in the toning process.



The three primary colors are called the three primary colors of color, and red, yellow, and blue are the three primary colors respectively on the color wheel.

When pigments are mixed, the color gradually darkens and becomes black, so this mixing is called subtractive mixing.

The watercolor technique is a representative example of subtractive mixing.

Any color can be created by mixing the three primary colors of color.



Generally, in digital coloring, transparency is added, resulting in intermediate color mixing. Unlike subtractive mixing, mixing with intermediate mixing adjusts the average brightness of the two colors. When mixing with intermediate blending, if colors with large differences in color are mixed, the saturation will drop significantly.

Brightness adjustment is convenient, but saturation adjustment is difficult, so it is not a suitable method for 1 light expression.

(Still, it's easier than traditional coloring...!!!)





## 2. Properties and Use of Color

Each color has a different hue, saturation, and lightness. This value is determined through the interaction of light and objects.

However, since color is a subjective sense, you can color the picture a little more colorfully by using each attribute. Let's learn how to use the properties of color to represent harmony or contrast in coloring.

### ① Hue



Depending on the color of the object and the wavelength of the light, the hue (hue) of the color to be painted is determined.

The stronger the illuminance of the light and the clearer the color of the light, the more affected by the color of the light.

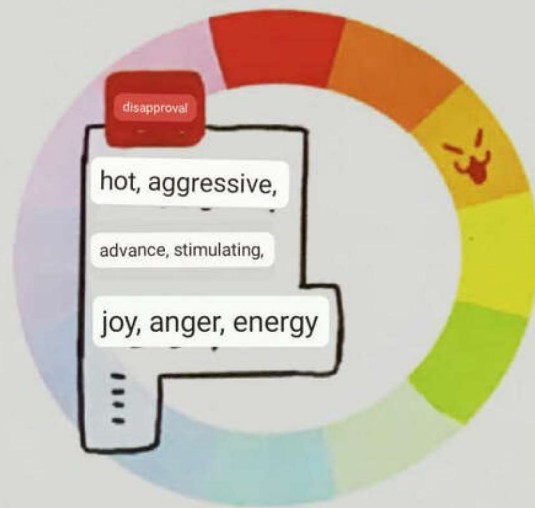
Since white light with an even wavelength of light does not have a specific color, only

the brightness and saturation of the object color are adjusted.

When light and object color are complementary, all of the light is absorbed by the object, so the color

of the object is not reflected, resulting in a dark color with saturation and brightness.

### ► Warm and cold colors



Warm colors and cold colors are representative examples of colors that people feel psychological

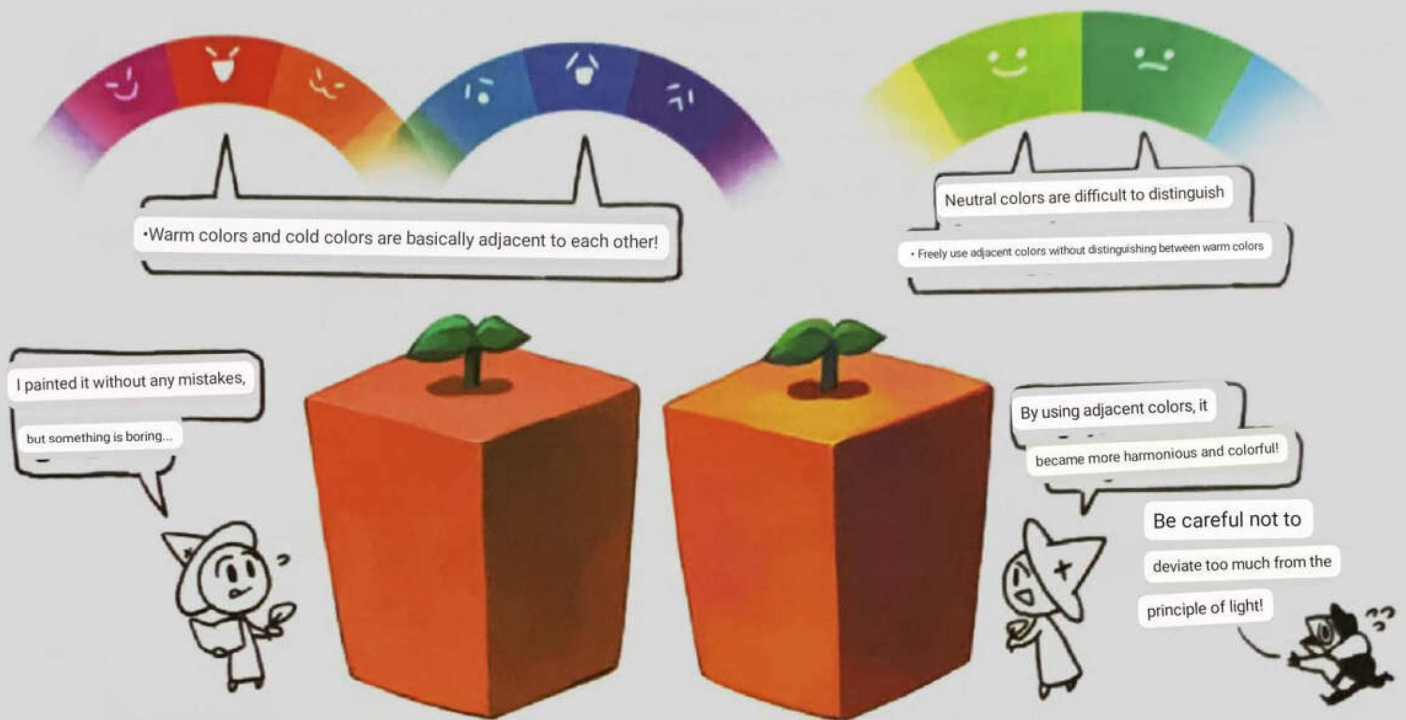
changes in. In natural light, the red wavelength of the sun stands out, making it red and yellow, and the sky has a soft color because the

blue wavelength is scattered. The red color that evokes the sun or flames is called a warm color, while the blue color that reminds us of water or ice

and snow is called cold. Purple and green feel warm or cold depending on the colors used together. These colors are called neutral

colors. When drawing an achromatic or neutral color-oriented picture, using warm and cold colors can psychologically give a difference in temperature.

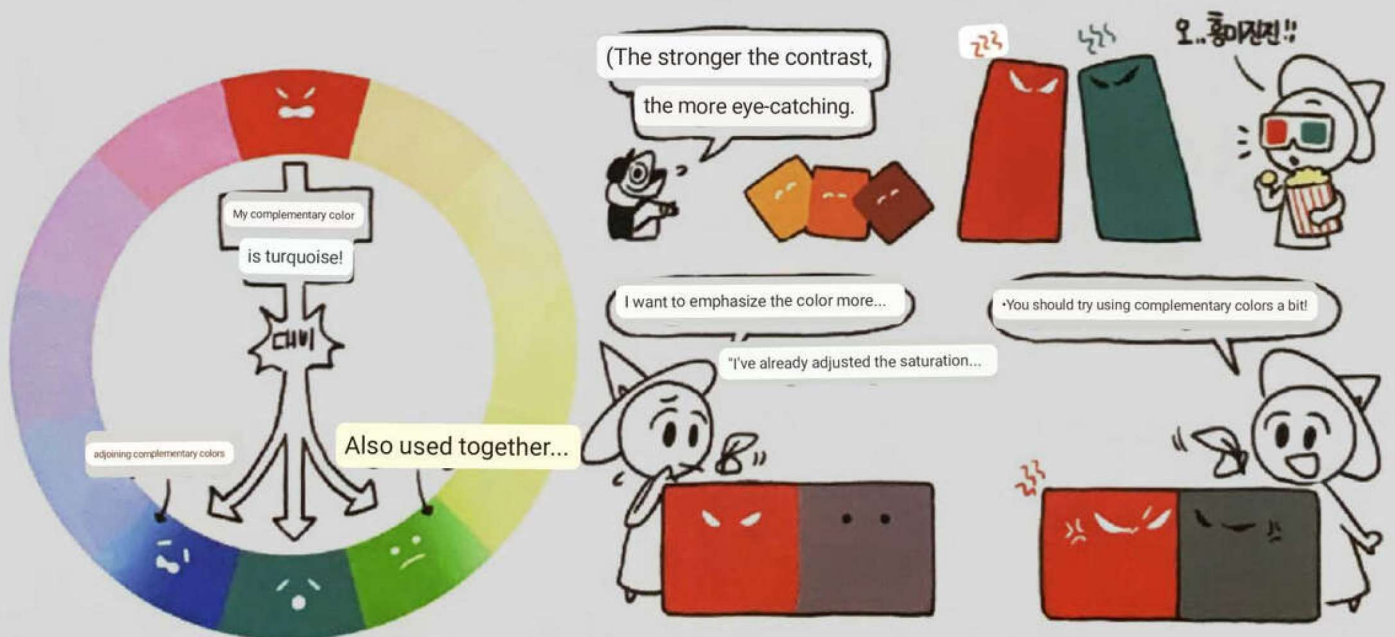
## ► Adjacent color harmony



The relationship of colors that are adjacent to each other on the color wheel is called adjacency.

Colors that are adjacent to each other harmoniously match each other, so you can try using adjacent colors in flat colors. In particular, neutral purple and green have a very wide color range, so they can actively utilize their adjacent colors.

## ► Complementary color contrast



The relationship between colors opposite each other on the color wheel is called a complementary color relationship.

Colors that are complementary to each other maximize the contrast between the two colors and play a role in emphasizing each color. Complementary

colors are sometimes intentionally used to further emphasize colors in their achromatic relationship with certain colors. "The intuitive

complementary color contrast of two colors can give a childish feeling, so I sometimes use adjacent complementary colors that use adjacent colors of complementary colors together.





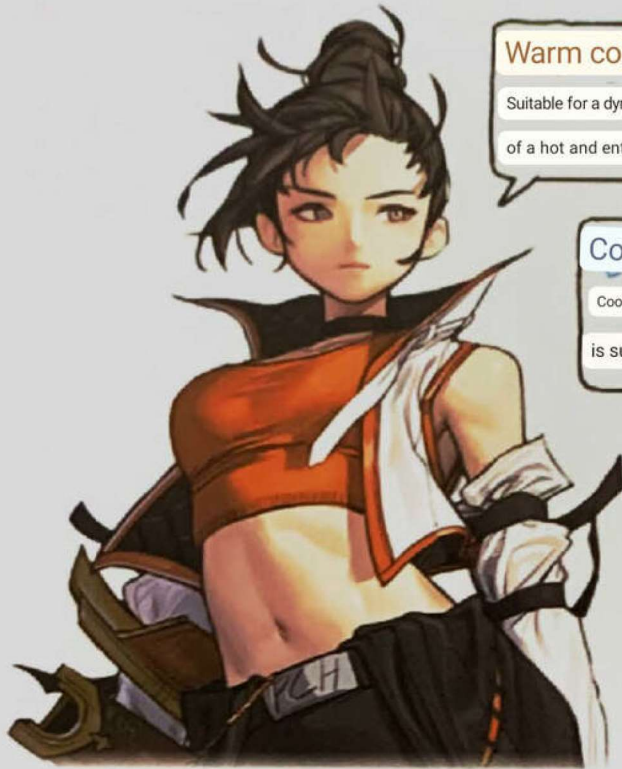
I think it's good that you can use colors freely compared to the light!

Let's observe the difference by using various colors!

[Hue is the most subjective property of color, so it can be used in a variety of ways!]



Warm colors and white are often used to adjust the overall mood of an image.

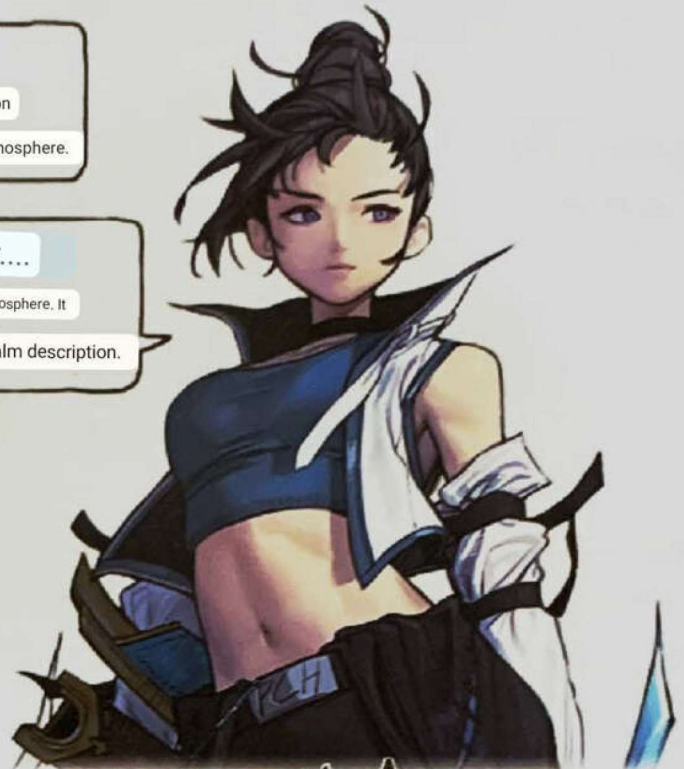


Warm color 00

Suitable for a dynamic depiction  
of a hot and enterprising atmosphere.

Cool color....

Cool and quiet atmosphere. It  
is suitable for calm description.



Alternatively, it is used to express the temperature difference between highlights and shadows.



Basic color...

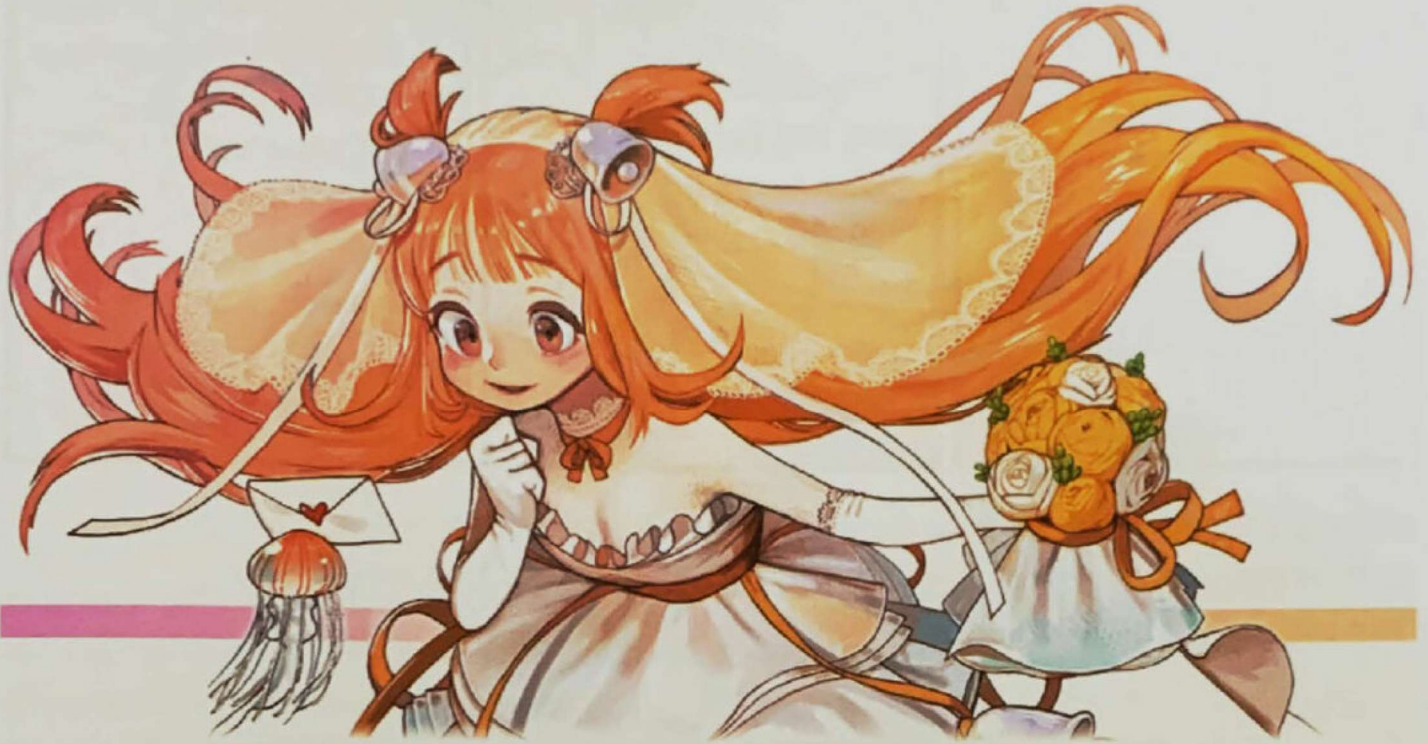
In fact, natural light

The color contrast between the words of the tree and the cold sky appears.



If you use the harmony of adjacent colors, you can color the colors that would otherwise be simple to paint more colorfully.

It is not a change in color due to light, so be careful because excessive color matching can reduce the realism of the picture.



To emphasize a specific color, contrast of saturation is most commonly used, but you can emphasize the color more by using the complementary color of the accent color.



As it is the most color-down property among the properties of color, various uses are possible!

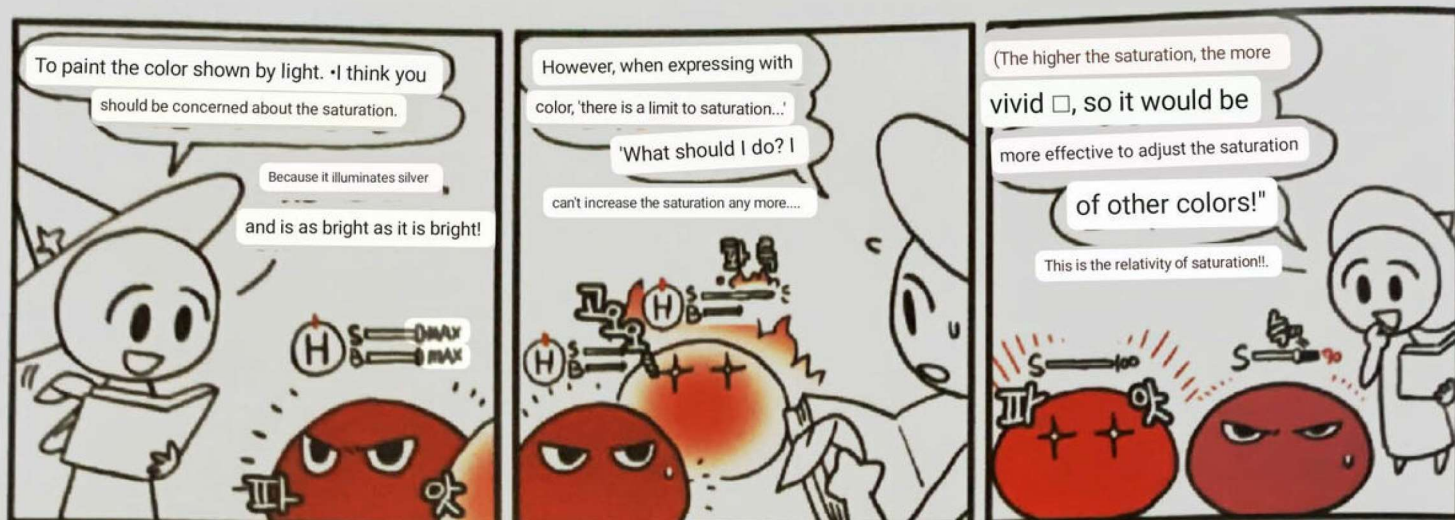
It's bright

It would be even better if you check the value and color it~

Each color has its own unique brightness.



## ② Saturation



Objects brightened by sufficient illumination will have a highly saturated color. Adjusting the saturation is as important as the brightness in the expression of light. However,

unlike light that is added and mixed, there is a limit to the expression of color saturation, so it is impossible to color with more vivid saturation than a certain number. It

is important to take advantage of the relativity of saturation, which makes the color appear more vivid when compared to a color with relatively low saturation.

## ▶ Relativity of Saturation



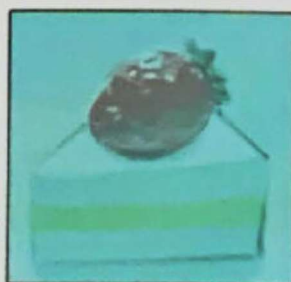
Saturation, which refers to how vivid a color is, is characterized by the fact that a color stands out more when it is next to a relatively dull

color. Also, colors with very vivid saturation do not stand out well compared to colors with high saturation. This is called

the relativity of saturation, and since there is a limit to the saturation that can be expressed in coloring, this characteristic must be utilized.



If the distribution of saturation is applied in reverse...

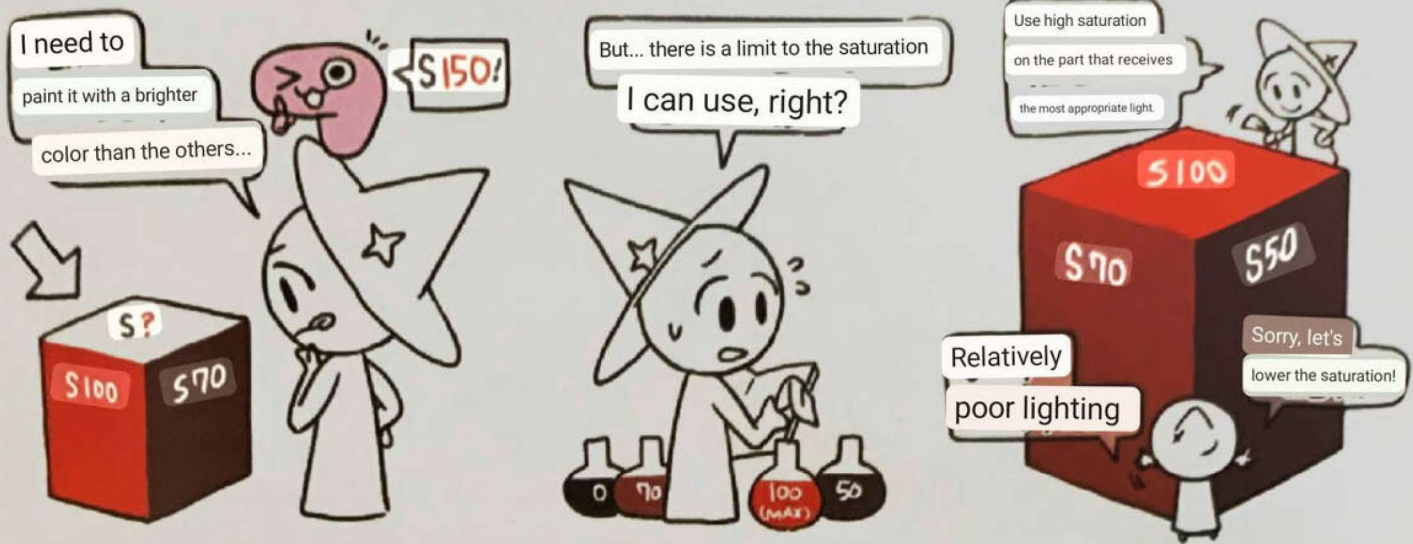


An achromatic color next to high saturation creates an optical illusion as if it is a complementary color.

Dramatically exploiting the relativity of saturation, an optical illusion of the appearance of complementary colors to adjacent achromatic colors can occur.



► Saturation control - Saturation is emphasized with light.



The more vivid the color, the better the expression of light, so emphasizing the saturation is a way to emphasize the expression of light. However, compared to the color

saturation that can be perceived by the eye, the saturation that can be reproduced by coloring is quite limited. If the color of the contrast boundary is

displayed vividly, the color of the highlight will be brighter and it will be closer to white, that is, achromatic color. In order to color the

highlights as vividly as possible, it is necessary to reduce the saturation of shadows and contrasting edges with relatively low illumination. However, since

brightness and value are objective properties compared to color and saturation, when adjusting the saturation, it is necessary to pay attention to the change of light and shade as well.

► High chroma picture and low chroma picture



The real world has very different saturation differences, so it is essential to control the saturation in realistic expressions!



That's the charm of the picture~

There is a characteristic that it is difficult to intuitively recognize the difference compared to the properties

of other colors. Overall, highly saturated and colorful paintings are good for expressing a splendid atmosphere through color harmony

and contrast. Conversely, a low-saturation picture is advantageous for realistic expression of light and shade, instead of showing the subjective atmosphere created

by color well. In fact, if you observe the world, you can see that the degree of saturation also varies greatly depending on various lights.





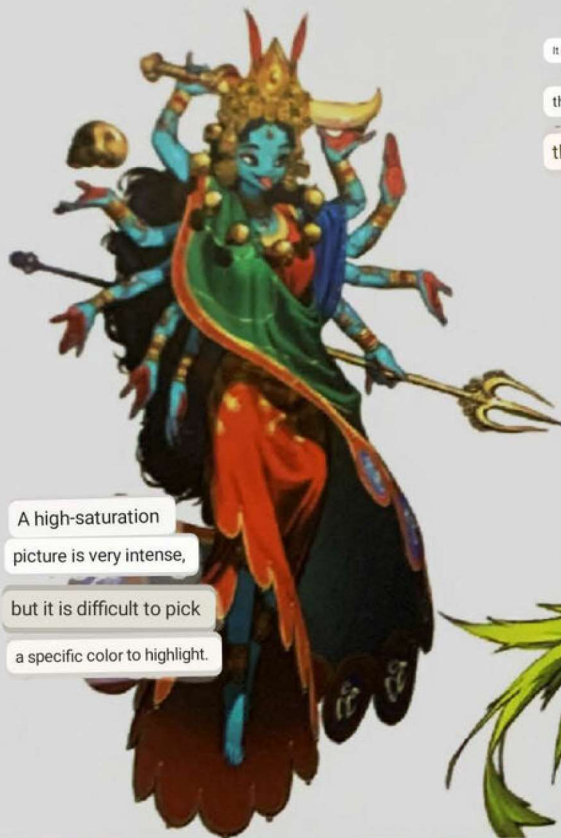
Compared to the properties of other colors, it definitely feels difficult to handle.

Is it because there is a limit to saturation, and adjusting the saturation itself is unfamiliar?

To control saturation well, you must understand the relativity and value of saturation.



If you want to emphasize the color of a specific color, it is effective to use the relativity of saturation to color.

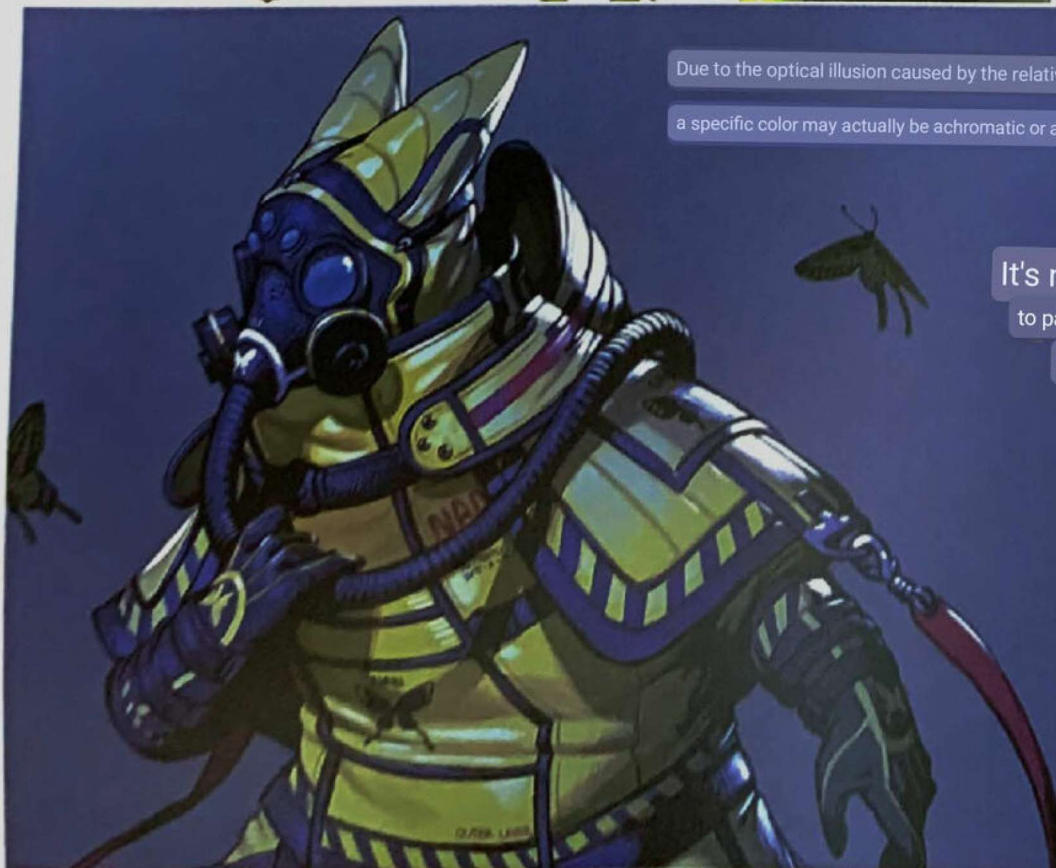


A high-saturation picture is very intense, but it is difficult to pick a specific color to highlight.

It emphasizes the light by expressing the color of the part receiving the light with high saturation...



The color of the drawing paper or objects with relatively low saturation is colored with a color of low saturation to emphasize the color.



Due to the optical illusion caused by the relativity of saturation, a color that appears to be a specific color may actually be achromatic or a completely different color.

It's natural to paint yellow objects yellow!

It may not actually be yellow due to an optical illusion caused by saturation contrast.



psychological color real color



It can be awkward if you paint it yellow as it is:



In the appropriate light, the saturation of the highlights is the highest, but there is a limit to the

saturation, so I lower the saturation of the contrast and shadows to color.

However, it should be noted that the value should not change while adjusting the saturation.



In high-saturation paintings, the lively emotions created by colorful colors stand out,

and in low-saturation paintings, the subjective feeling is not well expressed, but the realistic expression by contrast stands out.

Clear and  
lively atmosphere!



Relatively insensitive atmosphere...



\* Rather than sticking to only low- or high-saturation colors when coloring, it

would be better to practice expressing various chroma differences depending on the light or atmosphere!

It is often used because high-saturation colors are easy to read.

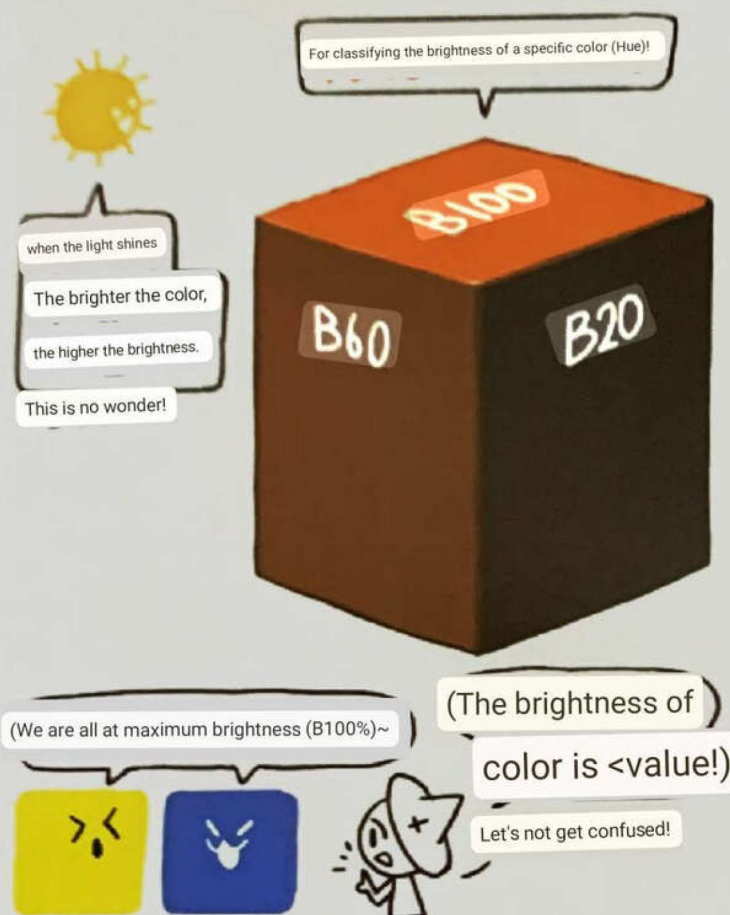
To use colors properly, it is effective to use chroma contrast.

Color matching with high saturation is more difficult than with low saturation.





### ③ Brightness

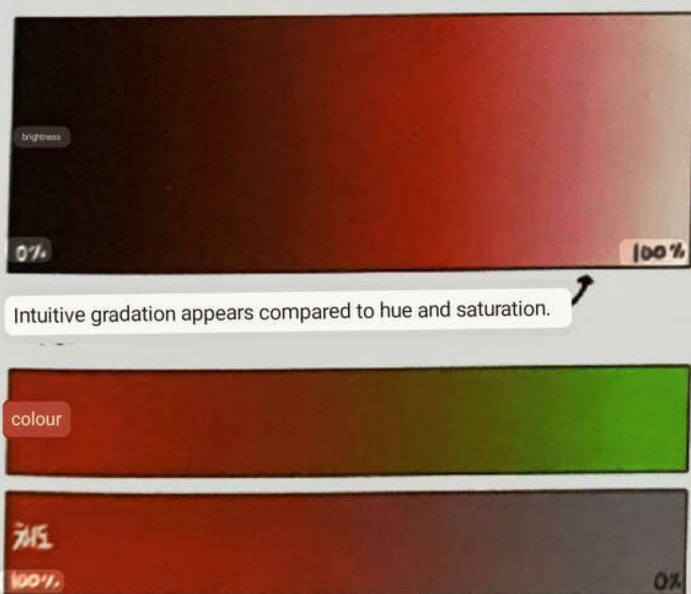


The brightness of the color (hue) that is brightened by the light is called brightness. The final brightness of color is not classified by brightness, but by the concept of value by hue, saturation, and brightness.

Brightness is most directly related to the value among the three properties of color, but even if the brightness is the same, the value may be different depending on the color and saturation.

It should be noted that brightness and value are different concepts, Let's see how brightness is used in coloring.

#### ► Gradient

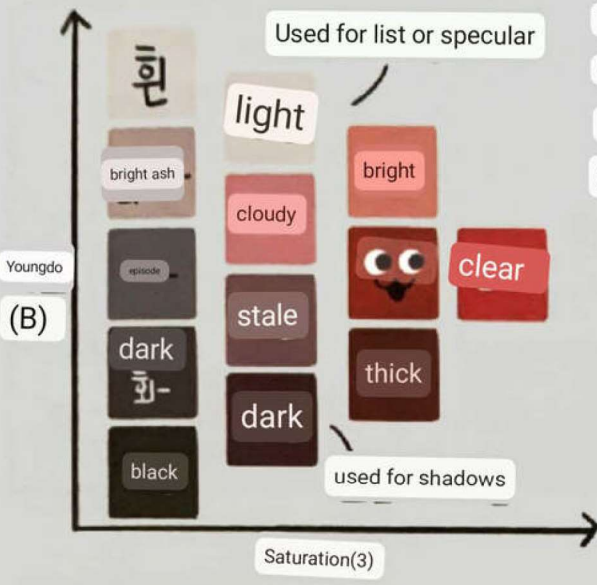


The richer the gradation, the more detailed shadows can be colored!



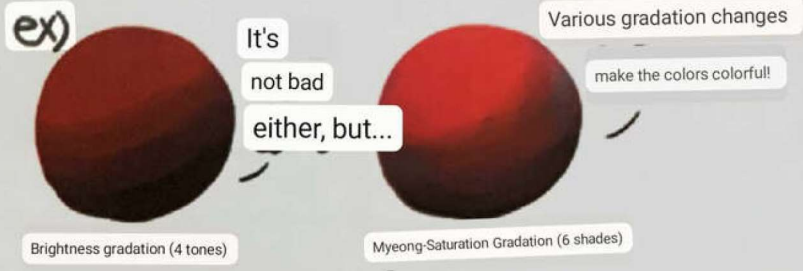
As the difference between light and dark brightness increases, the boundary between highlights and shadows becomes clearer, making the three-dimensional shape stand out. The stage of changing from one color to another is called gradation, and among the properties of color, lightness shows the expression of gradation well. The greater the difference in brightness between the two colors, the richer the gradation appears, and the smaller the difference in brightness, the fainter the gradation appears. With a relatively rich gradation, more detailed shadows can be colored, and a three-dimensional and realistic structure can be expressed.

► Tone

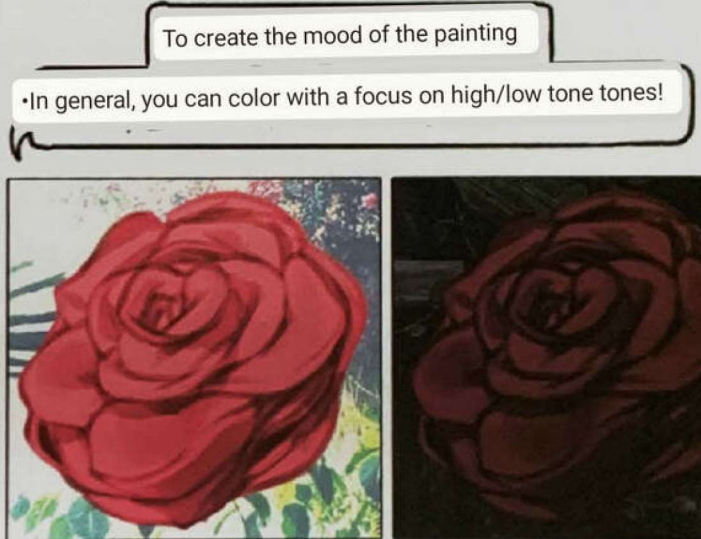
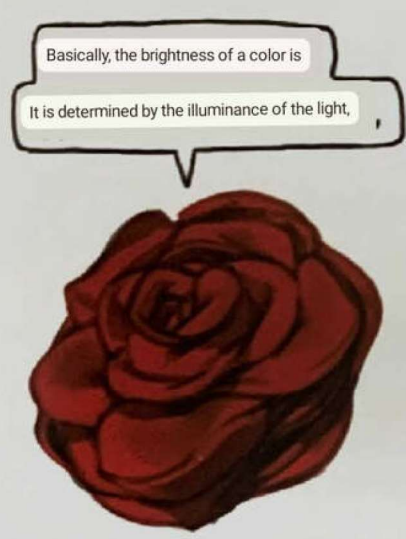


The concept of integrating the brightness and saturation of a particular color is called hue. When recoloring by changing the brightness and saturation of one color

If you use various shades to color, you can express various colors without changing the color.



► Low key, High key



objective

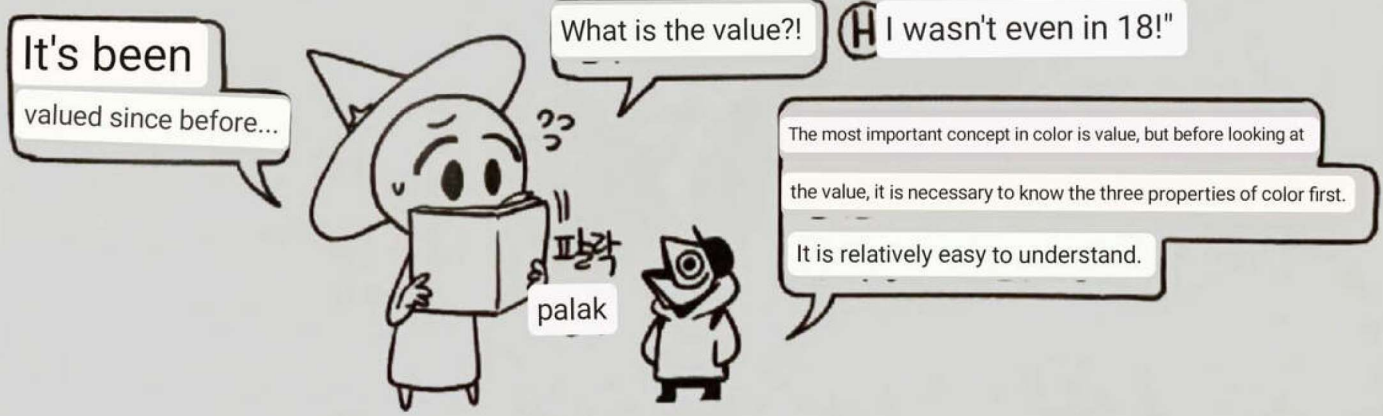
Rather than changing the properties of light

how to use color

pectoral

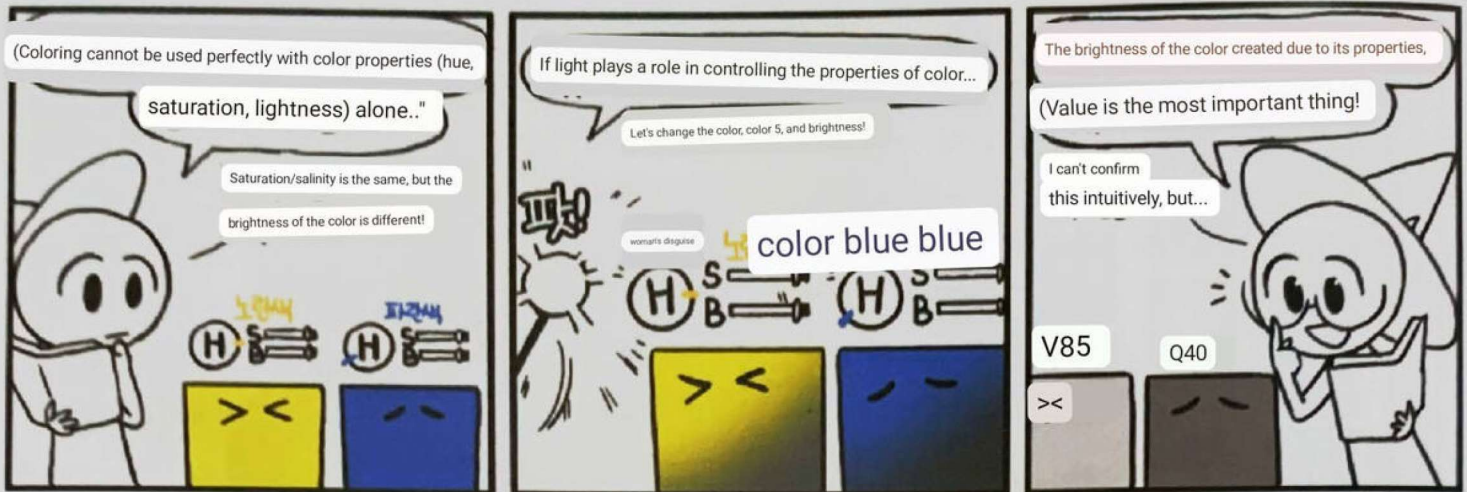
This is the realm of directing!

The brightness of a color is determined by the illuminance of the light, but the brightness of the overall color is intentionally adjusted to create the atmosphere of the picture. A painting painted in a low-brightness tone as a whole is called low-key, and a painting painted in a high-brightness tone is called high-key. Low-key's paintings have a gloomy and heavy atmosphere, while High-key's paintings have a bright and light atmosphere.





## ④ Value



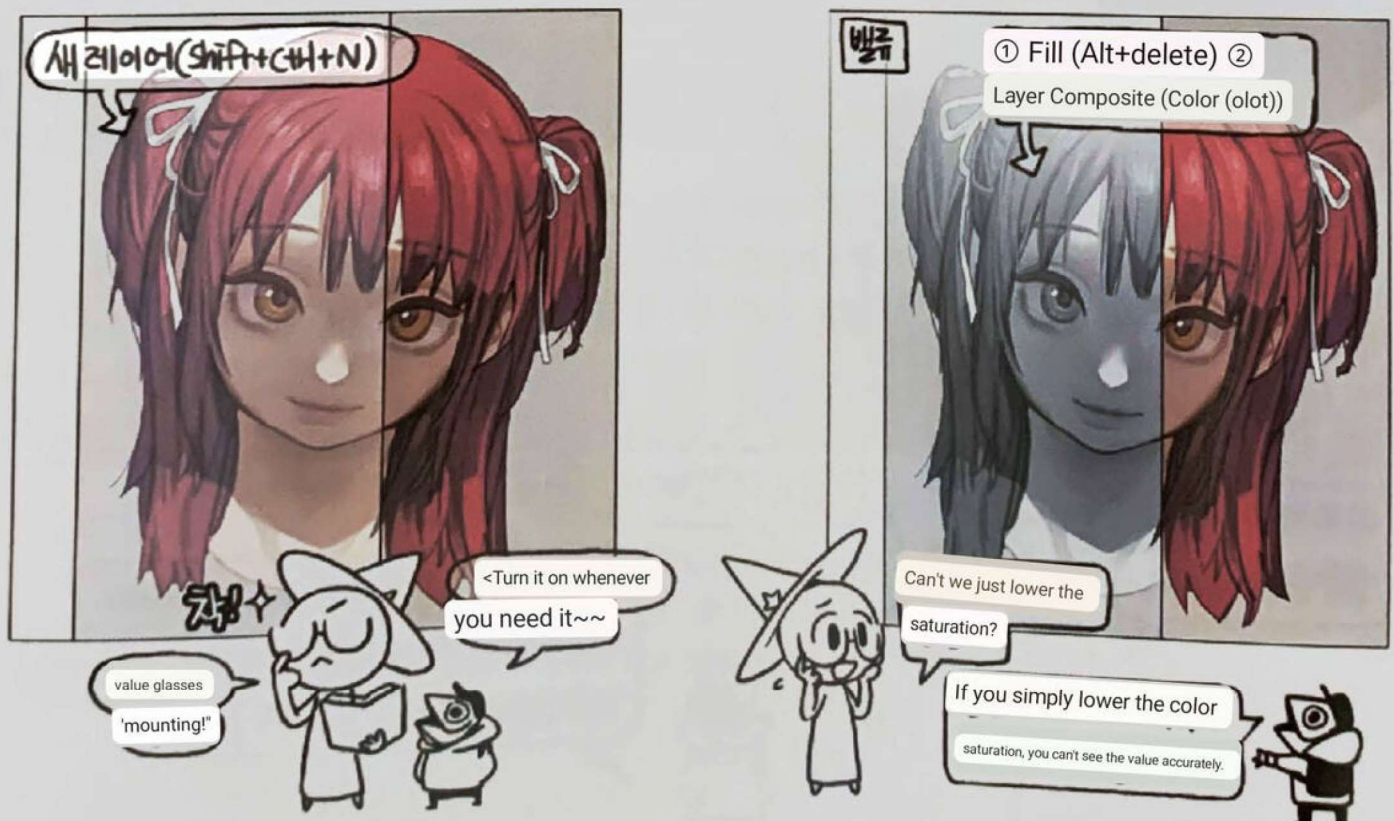
Value is the final brightness of a color that appears according to the color's hue, saturation, and lightness. It is very important to distinguish and determine the value when coloring light and shadow with various colors. Since the value is not an absolute number for a specific color, it is difficult to determine intuitively. Instead, if you understand and color these values well, you can color the world with more colorful colors than it really is.

## ► Check the value

When toning in digital painting like Photoshop, you can't adjust the value directly because you adjust the color, saturation, and brightness. Let's see how to easily view a picture as a monochrome image using the layer blending option.

## ① Create a new layer.

## ② Paint white and combine with color.





## ▶ Hue and Value

We are the color with both saturation and lightness at maximum (100%)!

(It's called purecolor!)

..just achromatic...

gat

An achromatic color without any color (gray) has a value in terms of brightness, but the value of a color that is bright and pure is different for each color. A bright and pure color refers to a pure color with no achromatic colors mixed with the maximum color saturation and brightness.

"This is the true brightness of the color, the value!"

Yellow is a very bright value.

Blue with the same saturation and brightness is very dark!

I'm... the same...)

If you check the value of a pure color, you can observe that there is a difference in the value of each color.

Yellow has a very bright value and blue has a very dark value, so the two colors look completely different grays.

If I remove the color (by lowering the saturation), the value is the same!! (I used Itu...

(All pure colors have the same brightness, so when there is no color, it becomes gray with the same brightness.

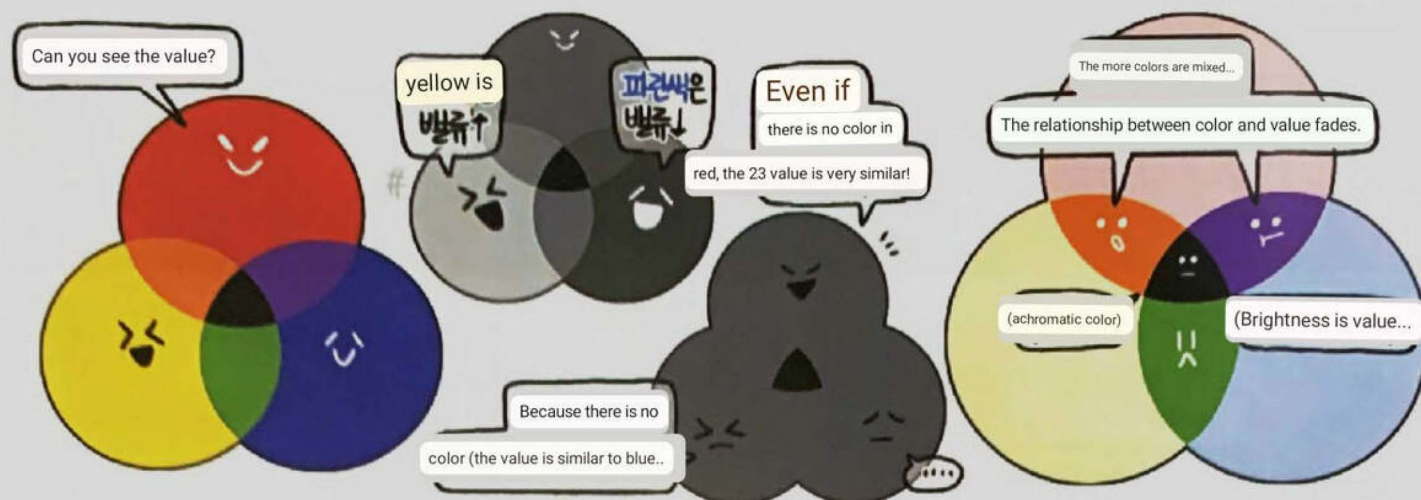
Let's be friendly.

welcome.)

All pure colors have the same brightness, and each color has a fixed value, so if you lower the saturation, they all become the same gray.







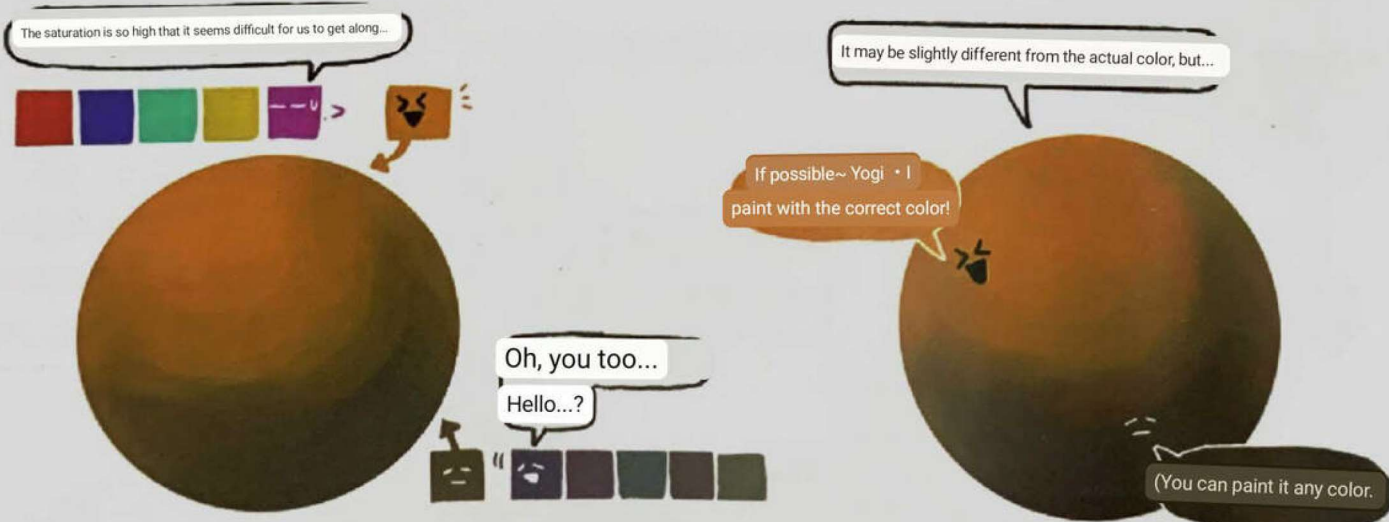
Among the three primary colors, yellow and blue have a very large difference in value from a color with reduced saturation, while red has a relatively small difference.

The color of the secondary color mixed with 3 primary colors has a smaller difference, and the value of the achromatic color (gray) with all the colors is the value.



The clearer the color, the more pronounced the difference in value by color, so you need to pay attention to the value, but

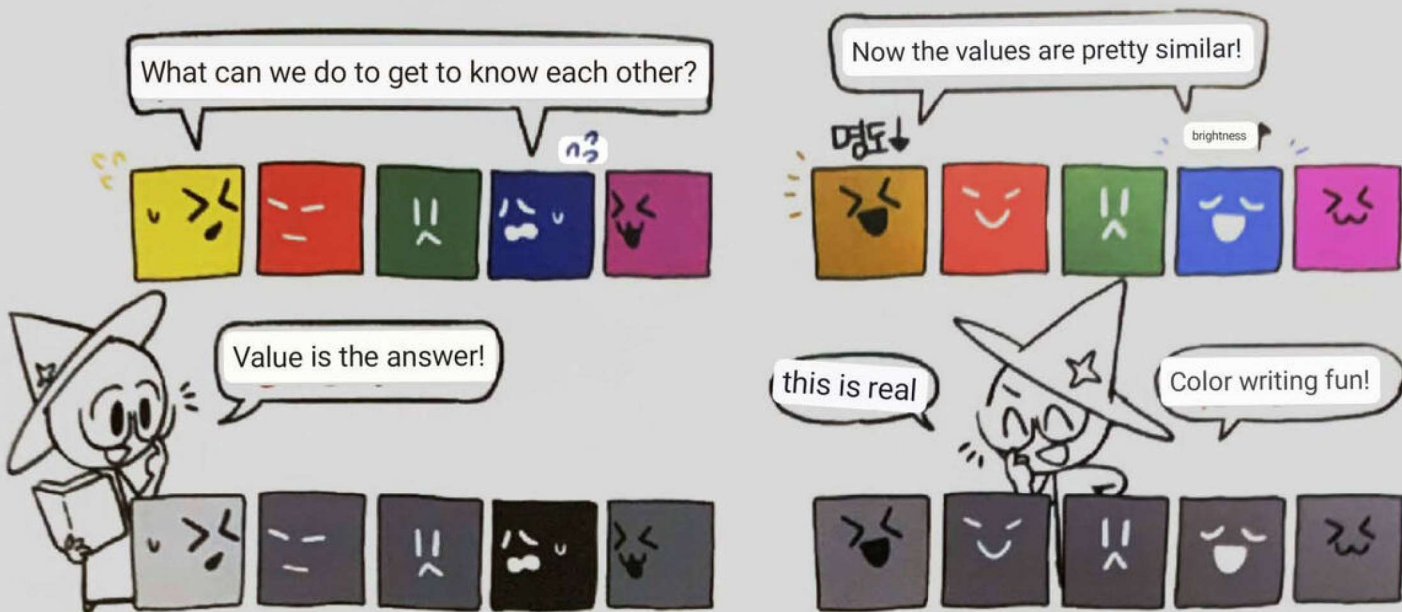
since the color with low saturation has relatively little difference in value by color, it goes well with each other regardless of color.



The value of the color becomes a very important attribute when choosing a color because the brightly lit highlights increase the color saturation.

On the other hand, shadows that cannot be lit by light are colored with colors with relatively low saturation and brightness, so you can freely color them with a variety of colors using similar or achromatic colors.

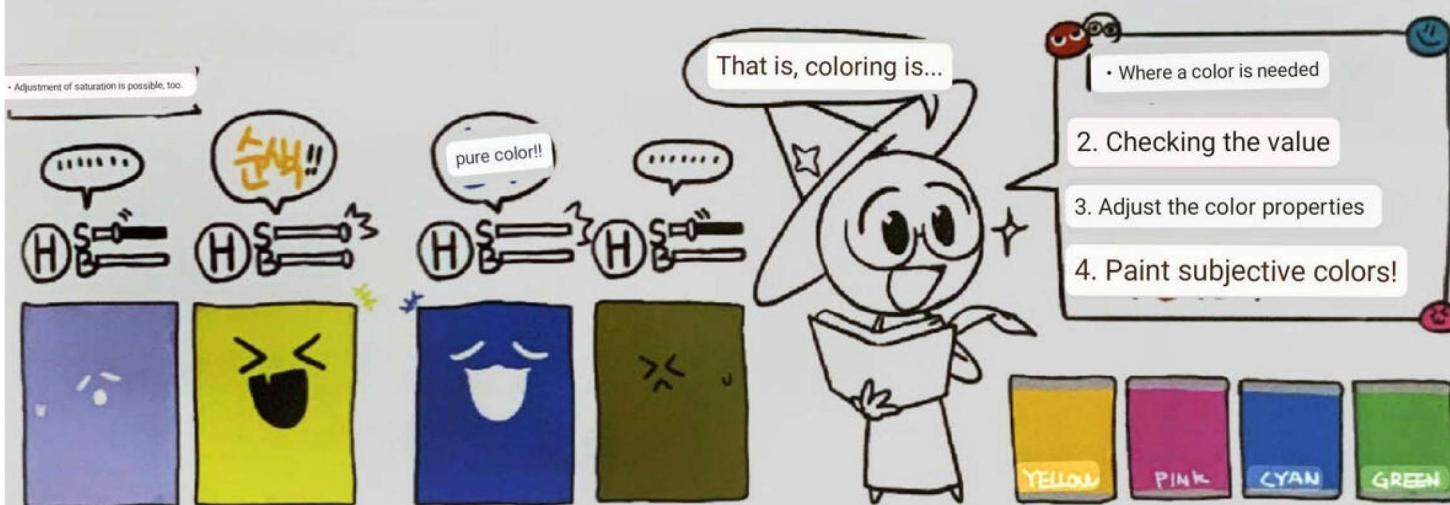
## Brightness and Value



Each color has a different value, so in order to unify the values of colors with opposite values, you need to adjust the color brightness. In

order to use yellow harmoniously with other colors, it is necessary to lower the brightness of the color considering that the value of the color is very

bright. Conversely, blue has a dark value, so you need to increase the brightness. The pure blue color is already at maximum brightness, so we desaturate it.



If you adjust the colors to have similar values, you can color using all the properties of colors, from pure colors to achromatic colors with opposite values. In other words,

the value of each color is different, the value of the color stands out according to the saturation, and the brightness of the color is adjusted when the value

is adjusted. If light determines the objective properties of color, coloring is to use subjective colors by adjusting the values.

[Value is not a property of color |

It is very difficult to

know how to handle it....!!

• Forgetting the properties of color (hue, saturation, lightness) for a

while and practice coloring with a 'subjective color'

(Let's do it!!

You need to develop your

sense of color!



## ► Value application color solid color

Unlike the hue/scale/brightness of a color, value is a property that cannot be directly controlled, so the colorer's sense is required. Sometimes

different values appear for each color, and sometimes colors with completely different properties appear with the same value. Let's

forget the properties of color for a moment and practice determining the color by checking only the value of the color.

1 Fill the canvas with a random color and create a new layer to check the value.

Change the layer blending option to color and fill it with white.



Shows the layer's visibility.

This is the layer to color in earnest. Fill it with any color.

• New layer

Equipped with value glasses!!

As it is an exercise to develop the sense of color, you should choose colors while observing only the flow.

Keep wearing it if possible

Only the value of the colored layer is checked and recolored with a random color. It is convenient to change the settings of the eyedropper.

I don't know exactly what color it is, but the difference in value can be observed."/

Shortcut !

Ignoring the value check layer

Extract the color of the coloring layer.

Choose your own color or...

You can colorize by adjusting the color properties.)



Let's color with as many different colors as possible and with the same value as much as possible.

Is this color a little brighter than I thought?

This color is darker than I thought...

I have to change the value by adjusting the hue/saturation/brightness again!

Use the brush freely.

TEXTURED

SOFT

HARD

It can be practiced more intuitively by directly mixing the colors rather than mixing them.

Mixed colors sometimes

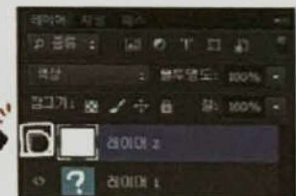
have values that are coincidentally correct.

Try increasing the brush opacity!

불투명도: 100% 혼합: 100%

If you turn off the visibility of the value check layer, you can see the bees have a constant variety of colors.

Turn off layer visibility.



[The color properties are all different, but they don't stand out and go well together!]



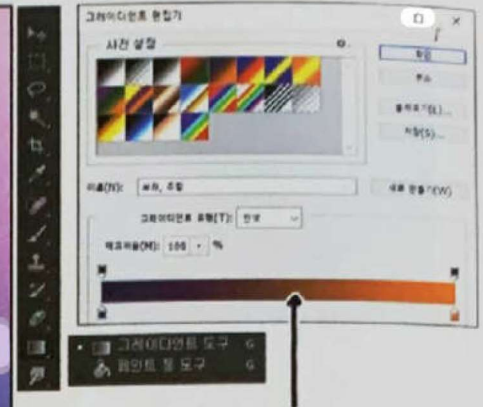
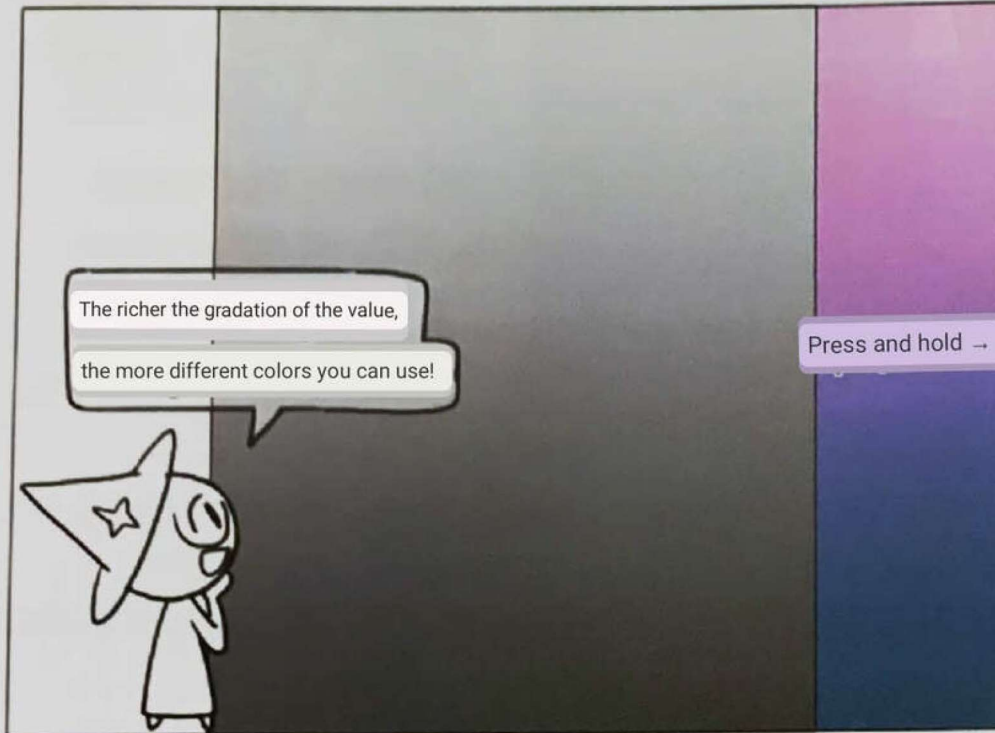


## ► Value application coloring - gradation

By applying the fact that each color has a different value, let's color the gradation that changes the value gradually.

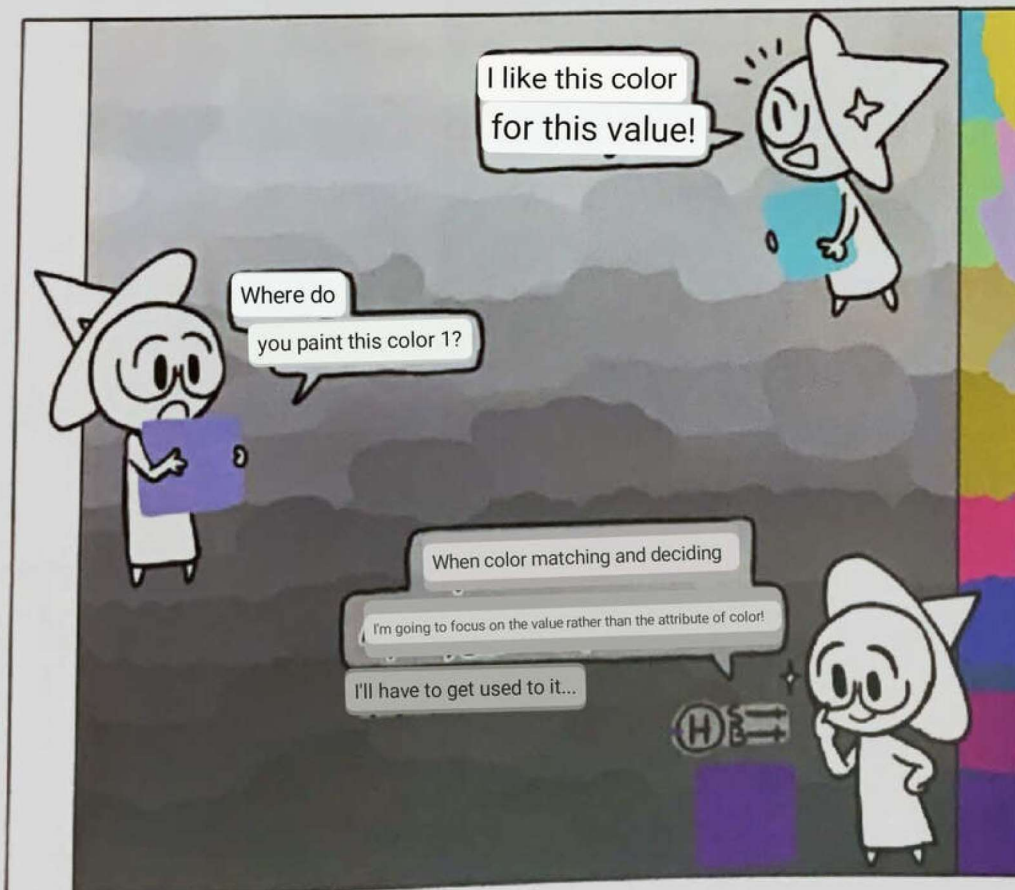
Rather than simply adjusting the brightness of a color, it is better to adjust the hue and saturation at the same time.

① Create a gradation using two random colors with different values, and create a value check layer.



The more different the properties of the two colors, the richer the gradation appears.

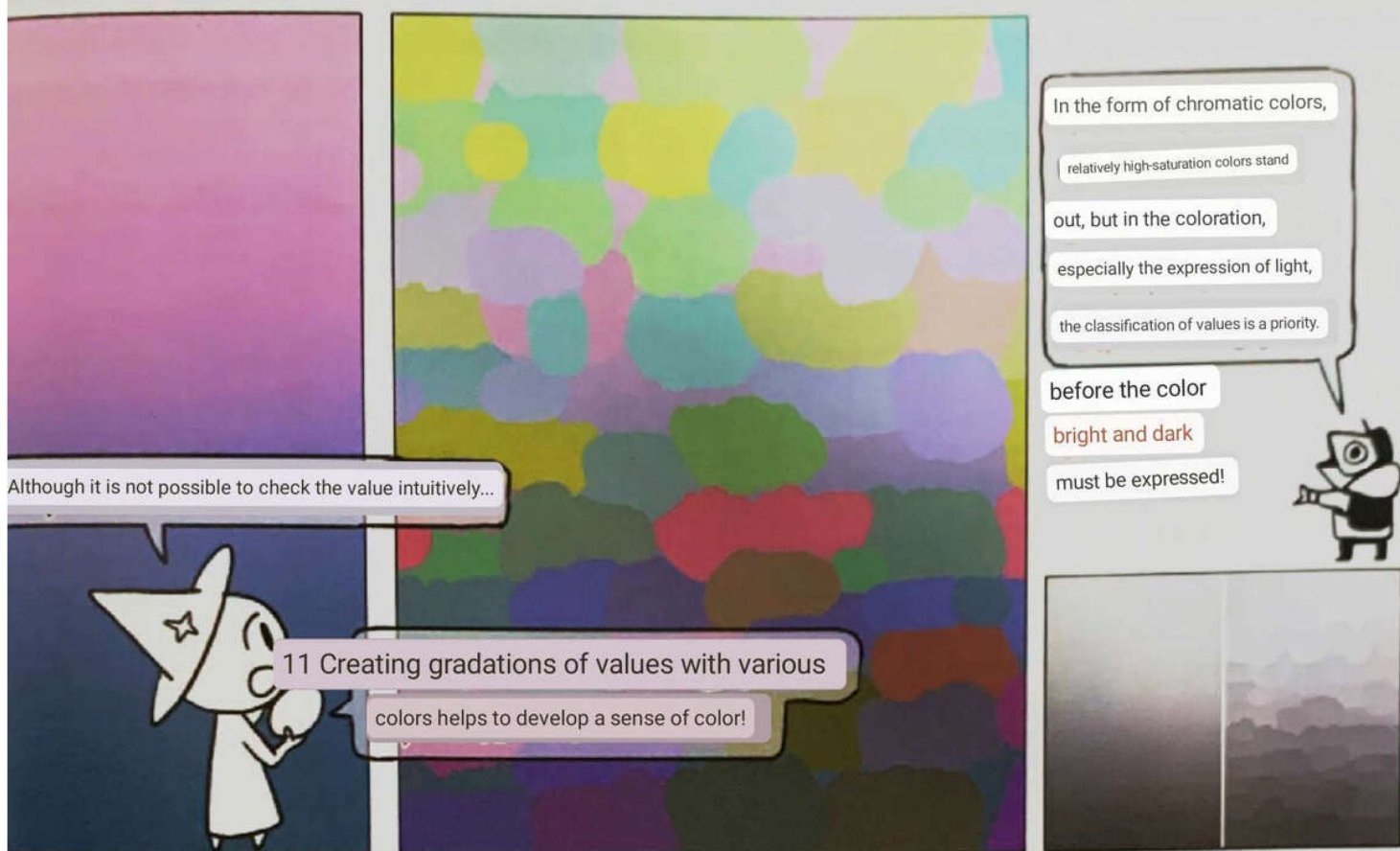
② Similarly, color with any color, but with a color that does not deviate from the existing gradation.



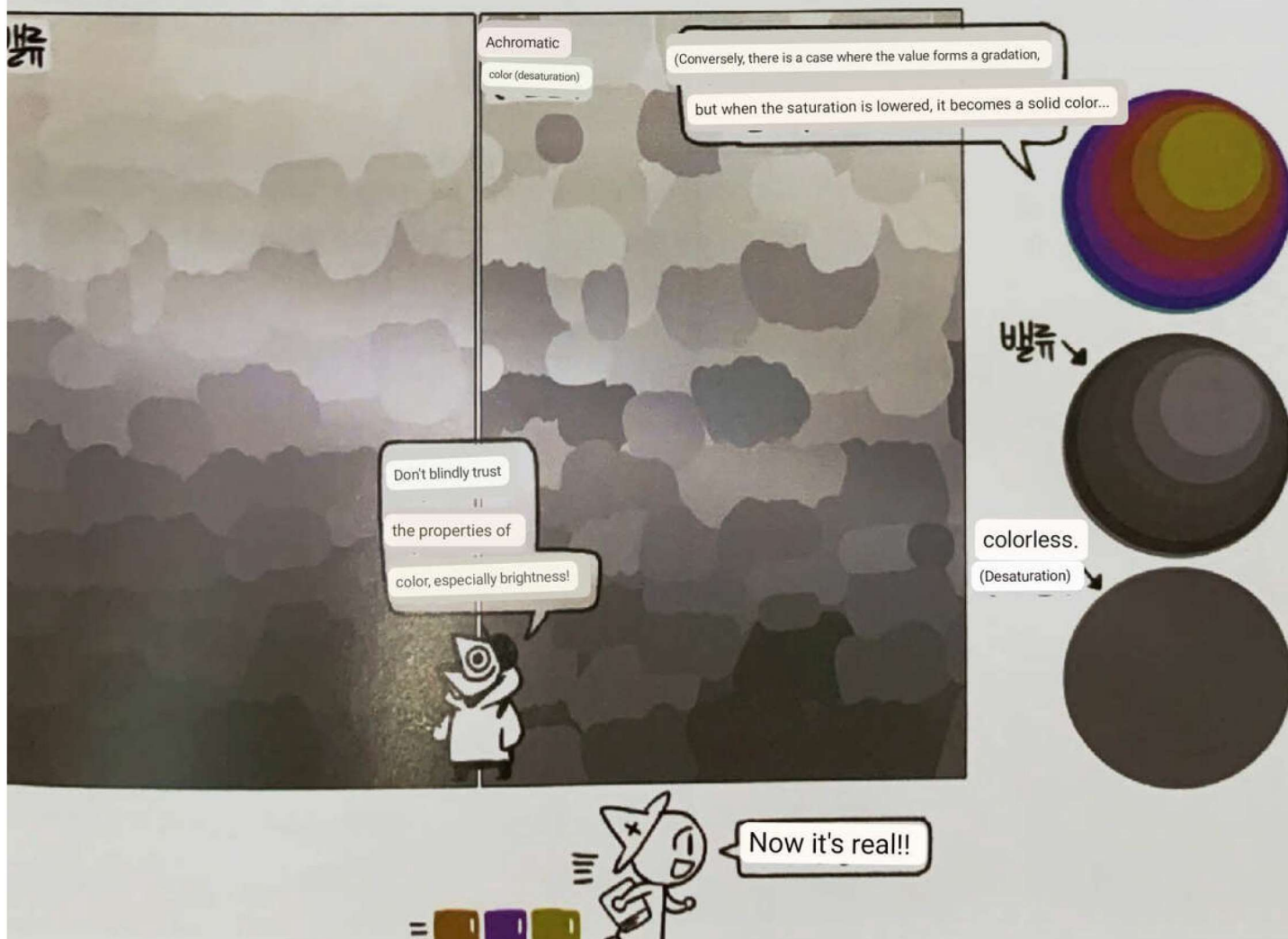
Let's select a color by directly adjusting the color properties (hue, saturation, brightness).

The first time you try it, it will take longer than you think!

Turn off the visibility of the value check layer, and check whether the values of various colors form a natural gradation.



It can be seen that the value of color is very different from the achromatic color with the desaturated color.



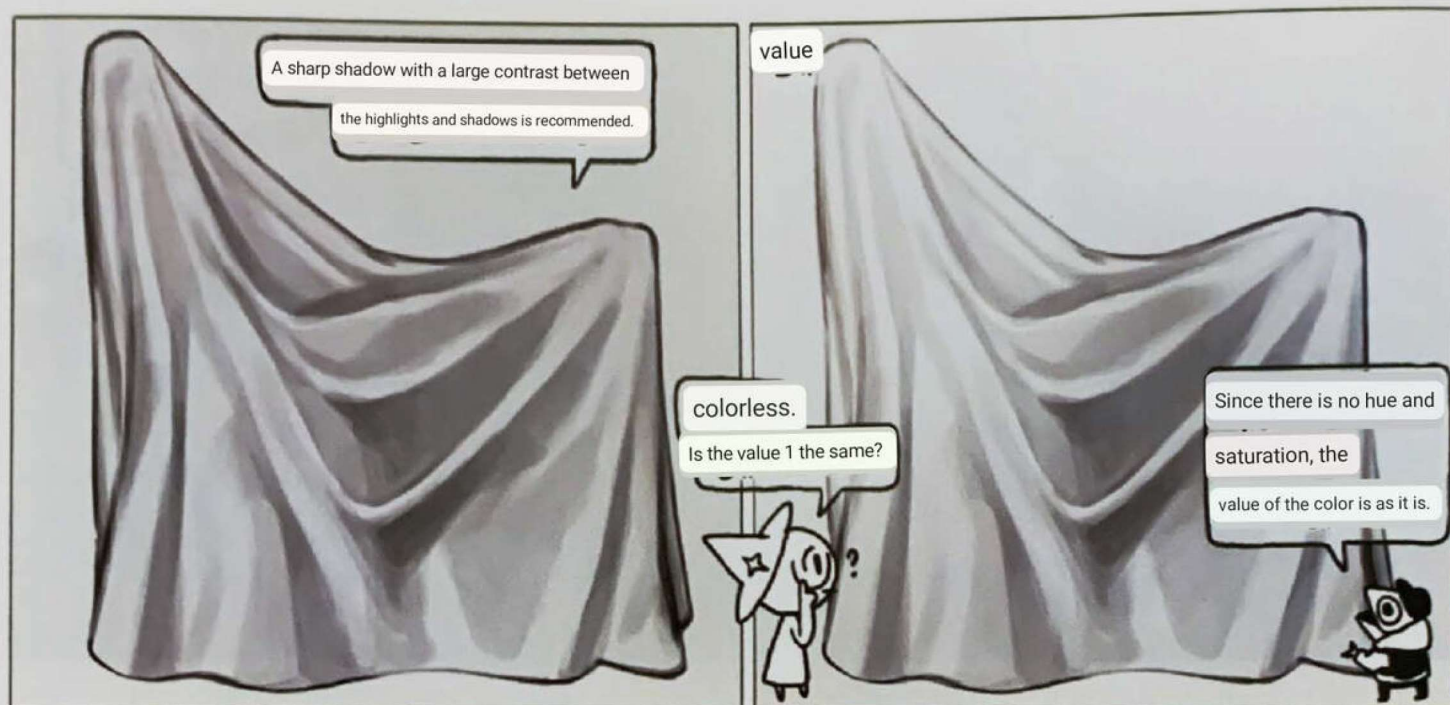


► Value Applied Coloring- Light and Shadow ①

The color of the highlight and shadow created by light and objects has a rich gradation of value.

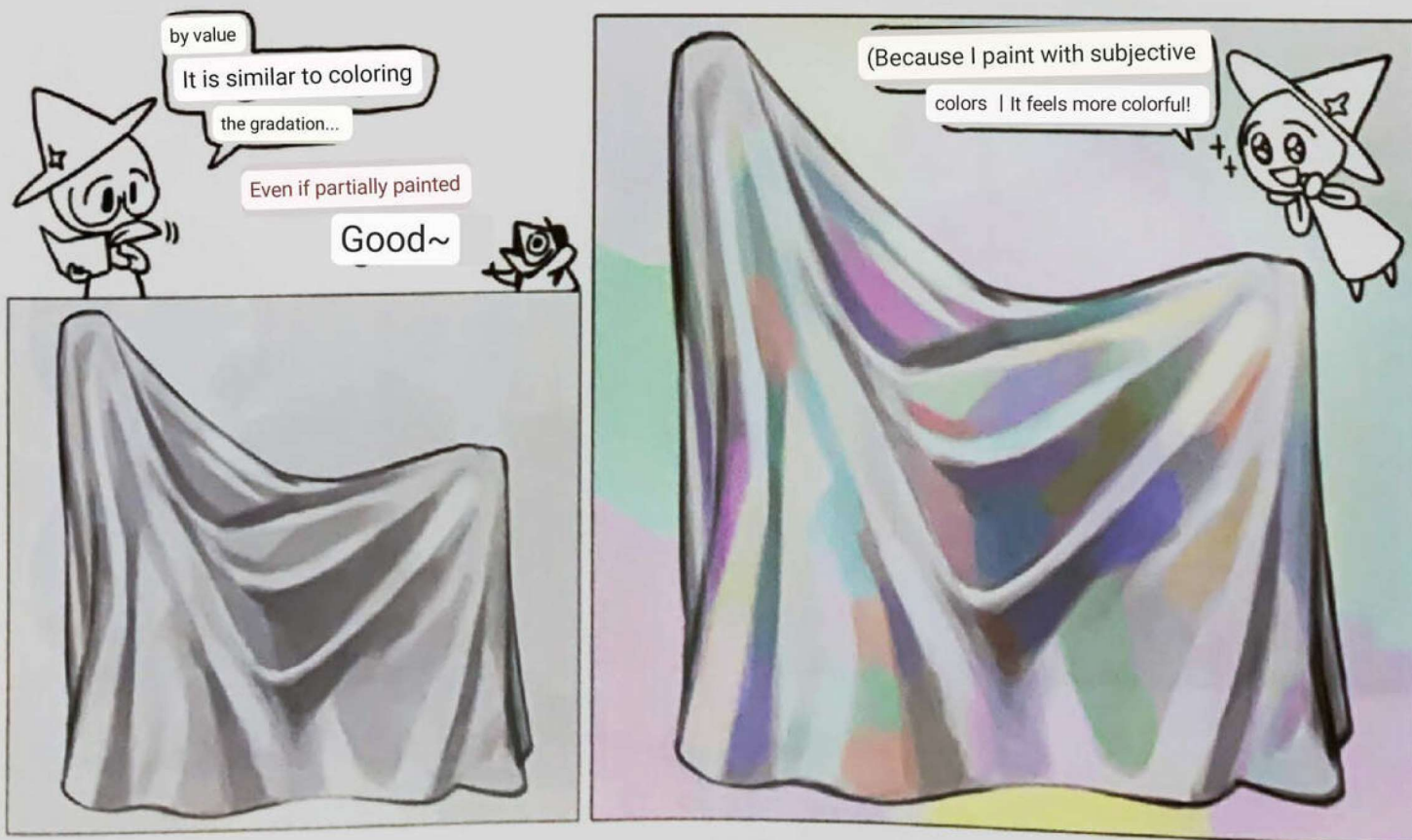
Based on the color displayed by light, let's color the light and shadow with various colors, paying attention to the value.

① Achromatic light is applied to an achromatic object, prepare an achromatic picture, and create a value confirmation layer.



② Color the colored layer with color and saturation on the colored layer, paying attention to the

value. After coloring, release the value check layer and check the three-dimensional effect created by the color value.





Value application coloring - light and shadow ②

Color properties are determined by how the object interacts with it, and sometimes colorful can also be observed. However, since color is a subjective sense felt by the observer, color can be expressed more freely and subjectively when coloring while keeping the value. Let's find out how to express the objective color you create and the subjective color you want to paint together.

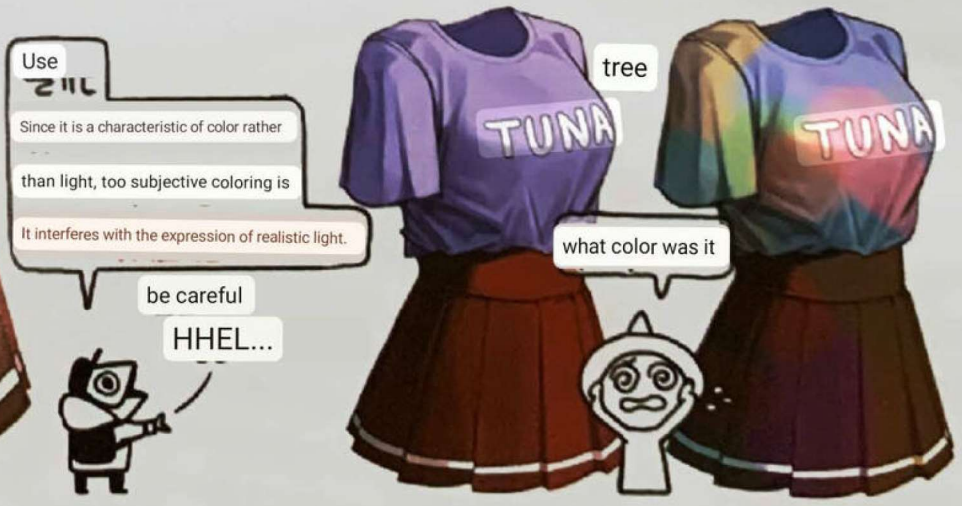
Prepare a non-achromatic object and a layer to check the value, and partially color the colored layer with a color with the same value.



② Turn off the visibility of the value check layer and check the color.



⚠ Even if the value of the overpainted color is the same, it is a color that has different properties, so colors that ignore the original color of the object are avoided. Since the highlights of objects that receive light often have vivid colors, it is recommended to paint over shadows with relatively low saturation.





## PART 07

coloring



# 1\_Coloring

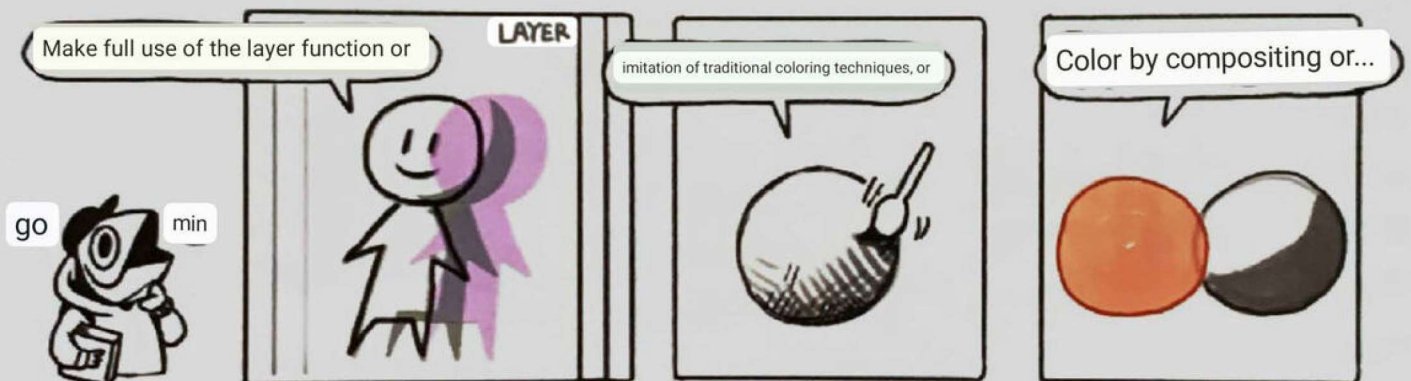
## ► Coloring and coloring methods



The act of coloring a picture is called coloring, and it is divided into coloring methods according to the pigment or method of coloring. In the past,

based on traditional paintings such as oil paintings and watercolors, coloring methods were divided according to the painter's style. With the

advancement of technology, the coloring methods have also been diversified, and research has been carried out on various coloring methods from chemical pigments to digital painting.



The coloring methods of modern digital painting, which do not have restrictions on the colors that can be mixed, are generally divided into several types depending on the coloring method. .



Depending on the object and purpose of coloring, or the taste of the creator, the appropriate coloring method may differ from situation to

situation. Let's learn and practice different coloring techniques, as characteristic coloring doesn't necessarily make a good picture.

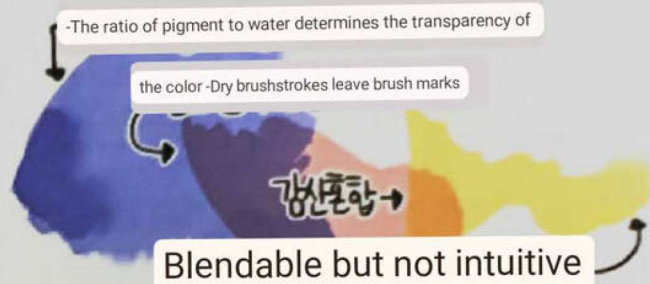


### 1. Representative coloring technique of painting

In order to use various colors efficiently, the technology for colored pigments has been steadily developing since the past. Various coloring pigments determine the working characteristics of coloring, such as mixing properties and drying time, and the coloring method is also classified according to expiration. The coloring method according to expiration is often copied in digital painting, so let's look at the representative coloring techniques used in Haha.

#### ① transparent watercolor

Watercolor painting is a technique of coloring paper, etc. by soaking it with water-soluble pigments to make the colors darker. It is characterized by intuitive brush strokes considering color transparency, and has been used for a long time without distinction between East and West.



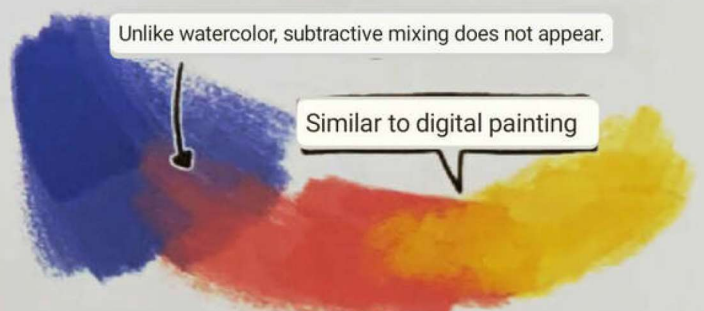
#### ② Opaque acrylic, oil painting (Impasto)

Opaque coloring is a technique of coloring using pigments combined with oil or chemicals, and can paint thicker than watercolor. A thick layer of pigment can completely hide the color of the canvas or background color, or it can be overlaid without mixing colors.



#### 3 Translucent - gouache

Gouache has a very high pigment to water ratio compared to watercolor, and is a pigment designed for use in opaque coloring methods. Opaque coloring is possible with a watercolor-like brushstroke, very similar to the function of a brush in digital painting.

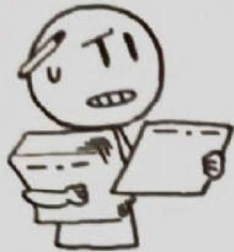




## 2. Representative coloring method of digital painting

## ① Cell coloring method

I can't go through  
all these drawings one by one!!!

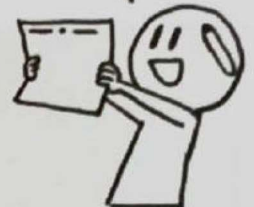


→ Use separate linework

The shape of the shadow is clear

► Use simple and unified colors

Instead of making the colors simple  
and vivid, make the delicate  
line art the charm of the picture!



This is a coloring method that expresses contrast by filling only the cells with color, which is the basis for drawing

animation. It has a characteristic that the color arrangement or shadow of the picture appears intuitively because it is described by distinguishing

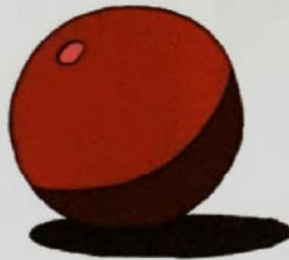
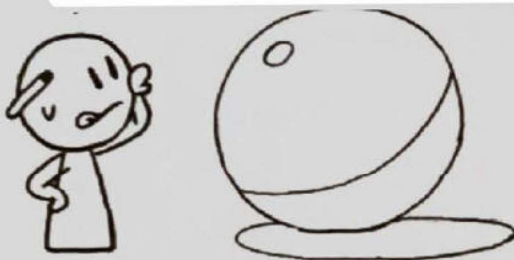
the color in a specific area. The role of layers is clear and you can take full advantage of the layer blending options, so linework and colors are well distinguished.

It takes time and detail until the  
line art is neatly completed...!!

V Most of my work is on line art...

Instead, the coloring is simple.

If it's clean it's ok!!



should be dark

Combining colors  
appropriately with layer blending

- The lack of description

is quick and  
simple with an airbrush!



By adjusting the color by combining layers, you can color more vivid colors, which is useful for bright and transparent coloring. In addition, the speed of coloring work is rather fast because the distinction between light and dark can be expressed intuitively.

Generally, gradation is  
expressed at the border  
between light and dark.



I can't describe the  
gradation in detail day by day due to work efficiency...

A pile  
of things to do...



Instead, let's describe the  
line drawings and colors neatly!!



The cell-type coloring method is suitable for cartoon expression because it is not possible to describe the color gradation with brush strokes, so there is a limit to depicting a three-dimensional effect.



## ► Learn about layer blending options

Cellular coloring, which utilizes many layers, can take full advantage of the compositing capabilities of digital painting programs.

Let's take a look at some of the features that help with coloring.

### 1 Normal

This is the default setting to color over the layer's opacity.

### 2 Multiply

Composite dark. It is often used when painting shadows.

### 3 Linear Burn

Subtractive mix. Since it is unconditionally dark, it is mainly used for line art.

### 4 Screen

Composite brightly. It is mainly used for lights.

### 5 Color / Linear Dodge Additive blending.

It is mainly used for specular.

### 5 Overlay / Soft Light

It is halfway between multiplication and screen, and depending on the color, it can be darkened or

lightened. It increases the saturation and is often used to correct the overall color.



List, specular uses

④ screen (color of light source)

the overall color.

⑥ Use of overlays

Use the shadow by multiplying it by ② (color of ambient light)

For line drawing, use ③ line number

in other coloring methods

for efficient work

as it is used very often

Learn the basics

Translated text

Select all

Listen

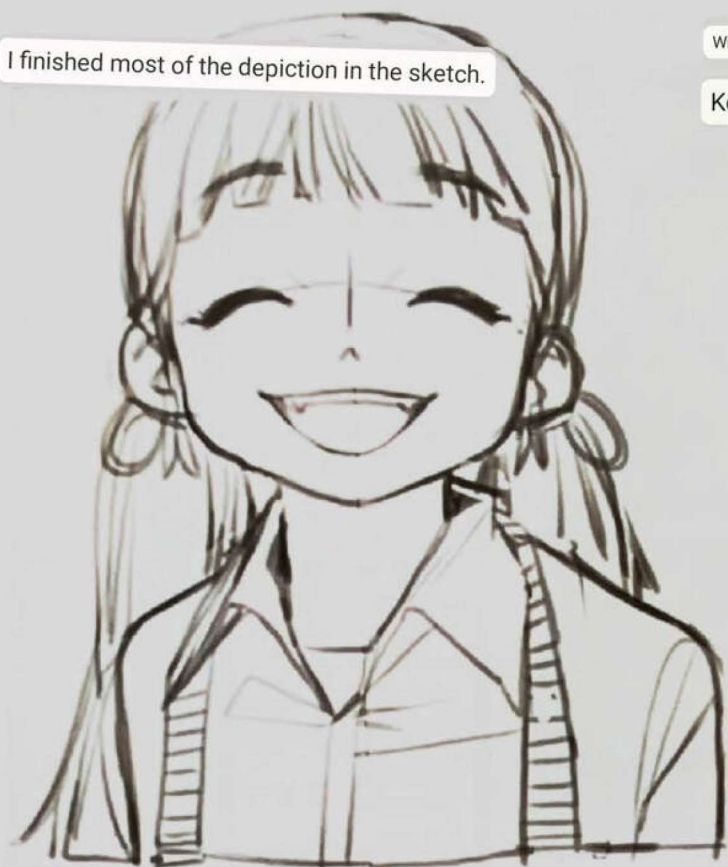
Share

Open in Translate

## Order of cell coloring method

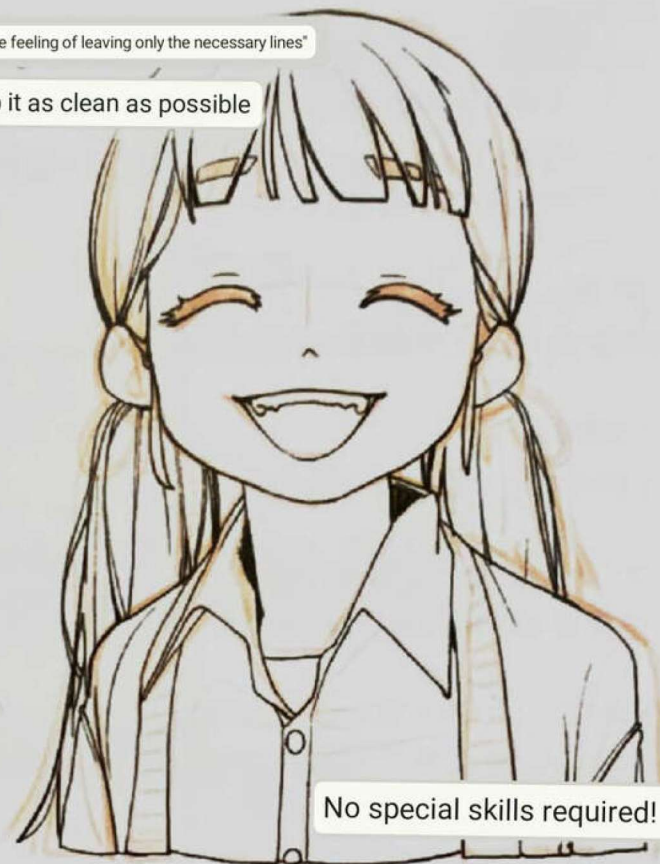
1. Draw a clean line art on top of the sketch. It is a very time-consuming task as it has to be drawn without any special instructions.

I finished most of the depiction in the sketch.

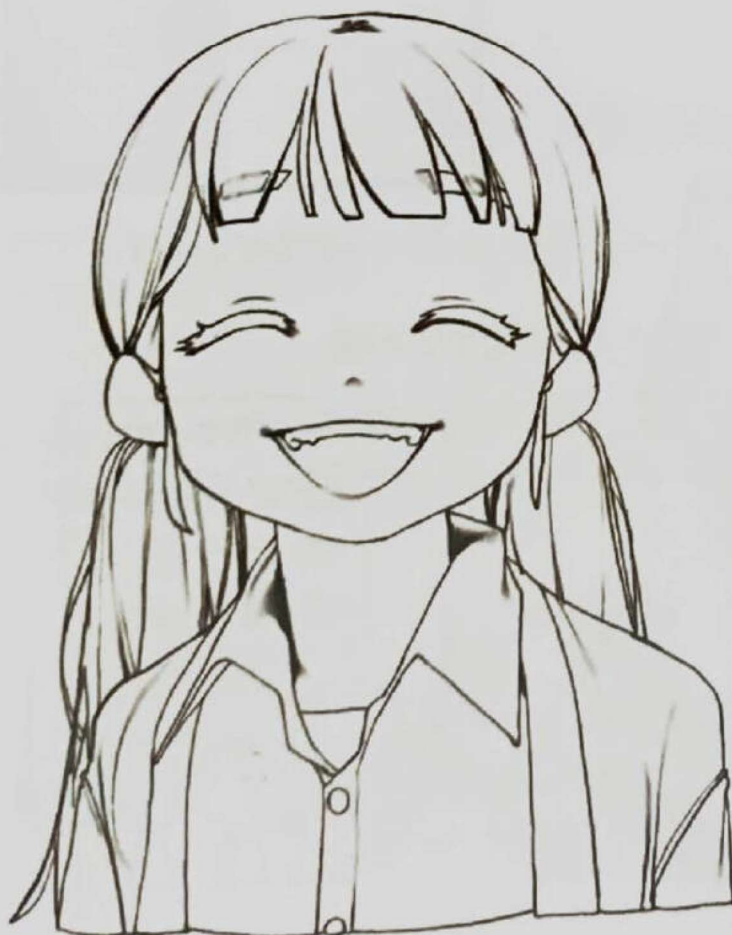


With the feeling of leaving only the necessary lines\*

Keep it as clean as possible



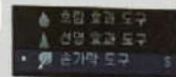
No special skills required!



2. Arrange the line art.

Erase unnecessary lines, or naturally blur the ends of the lines.

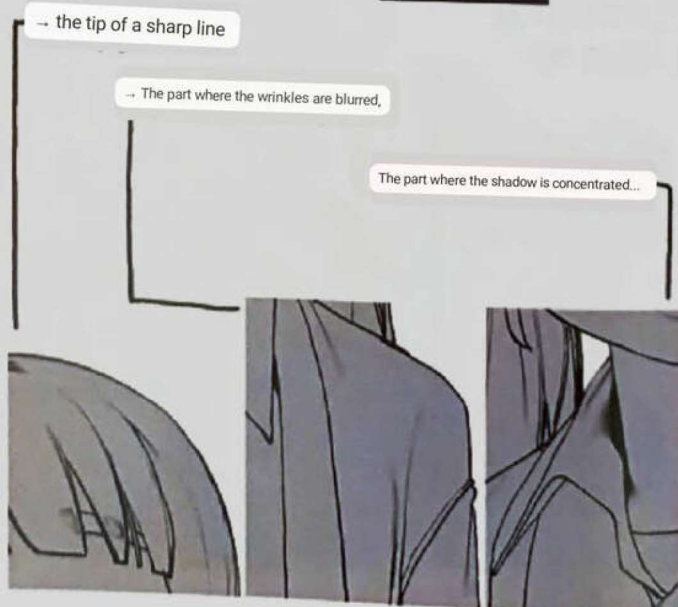
It is convenient to use two fingers.



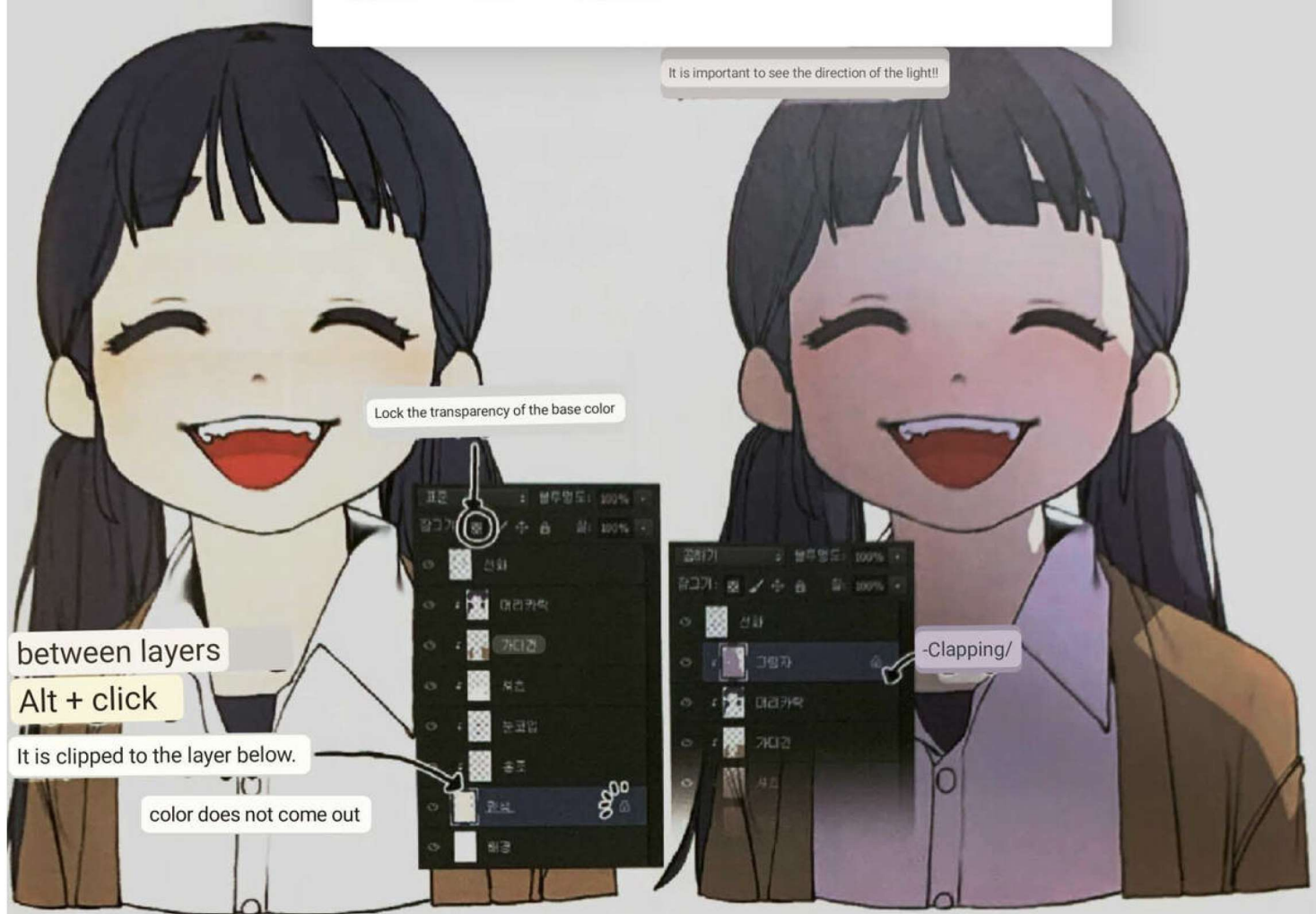
→ the tip of a sharp line

→ The part where the wrinkles are blurred,

The part where the shadow is concentrated...

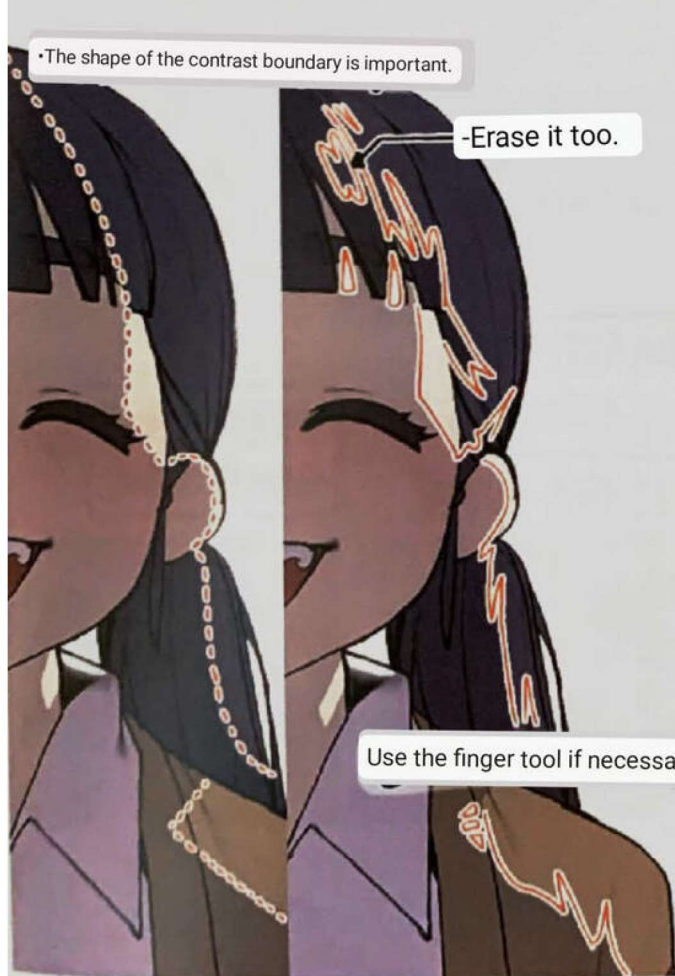






1. paint the colors neatly and color them with a clipping mask.

4. Apply shadows according to the light direction by multiplication composition.



Refine the shape around the border of the shadow.

6. Adjust the color by calibrating the shadow layer.



## 7. Create a new shadow layer

Overlay the insufficient contrast.

Adjust it in the same way as a traditional shadow layer to

reveal a color that suits your taste.



I paint over the areas where the

shadows gather and the shadows of

small folds to give the impression of

drawing a shape.

A rather vivid pink color is softly

synthesized for a lively

skin color expression.



## 8. Black line art is unnatural

Replaces the color of the line art in whole or in

part. Linear burn synthesis can be used.

By lowering the transparency of the

line art, [Transparent watercolor feeling..

Even if the outline is dark, it looks natural!

To make the color stand out by

synthesizing it with vivid colors



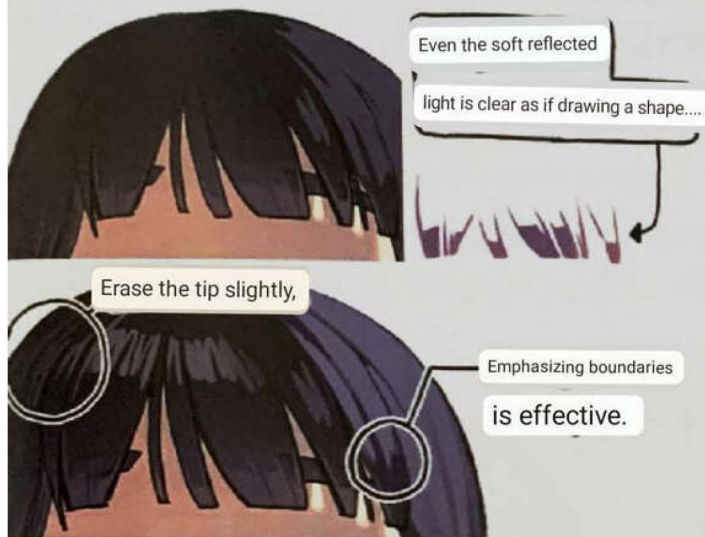


The reflected light and specular are painted according to the material

of the object. It is recommended to color the

soft expression first, and then paint the high-definition specular

last. You can utilize cystic/linear dodge compositing.



0. Finish by coloring the parts that could not be described

with line drawings or small differences in light and

shade. In the final stage, it is recommended to paint in detail

like drawing with a pencil rather than using the compositing function.



thank you for your effort!

After the line

drawing, the coloring is simple...



## ② Watercolor painting method

Digital is just a difference in tools, you have to paint the colors yourself!

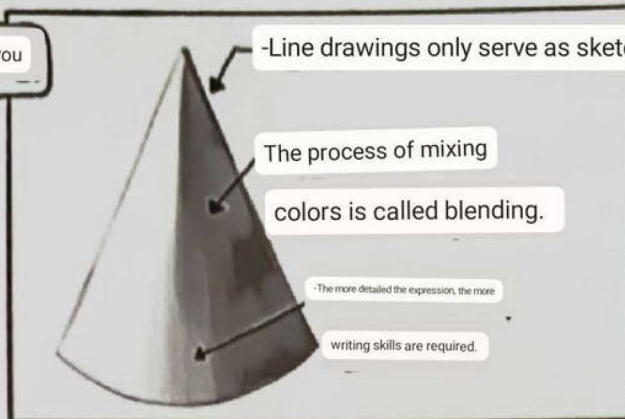


-Line drawings only serve as sketches...

The process of mixing colors is called blending.

-The more detailed the expression, the more

writing skills are required.



It is quite difficult to color directly, but it is possible to express it in detail!



This technique uses the brush tool of a digital painting program like a brush to paint over colors directly. The brush tool is a blending method that adds opacity, so it can be used similarly to translucent coloring techniques such as gouache. Although the handwriting of the creator is required as much as direct painting with color, it is the basis of digital painting because of the great potential of depiction.

Line art is an extension of the sketch, and the more detailed it is, the easier it is to describe.

Let's just do

what we need...



- the outlines are clearly visible

Let's change the sketching

method for smooth gradation!

Expressing the strength and weakness of lines in necessary areas



Blending as planned is the beginning and end of the description!



The more you refine your brush strokes, the more detailed you can express, and the more freely you can use colors, the better your sense of color writing is. In addition, if necessary, you can color using the various compositing functions of the digital program.

'Filling' and 'coloring' are the easiest~



Haha... it's so hard...!!

Whenever I draw...



Use the compositing function to shorten your work time.

Multiply or Overlay.



Because it utilizes the settings of the brush rather than the layer, the creator's handwriting and the settings of the brush greatly affect the overall work. Compared to other coloring methods, it takes a long time to describe and it is difficult to correct, so it takes a long time to work.



▶ Setting the brush

Using the brush tool in Photoshop, etc., you can color in various ways.

Let's see how to set up and use the brush's features. The default shortcut is FS.

① Brush Presets

Load the brush with saved settings.

Right-click on the canvas in brush mode to open it.

2 times shape. ③ Brush size, ④ Hardness can be easily adjusted.

5 Shape dynamics

sets the element that controls the size of the brush. Set the

pen pressure of the tablet pen as the default, and

adjust the minimum diameter according to your preference.



6 Transfer

Set the element that controls the transparency of the brush.

If the minimum opacity is low, it is easy to paint like watercolor,

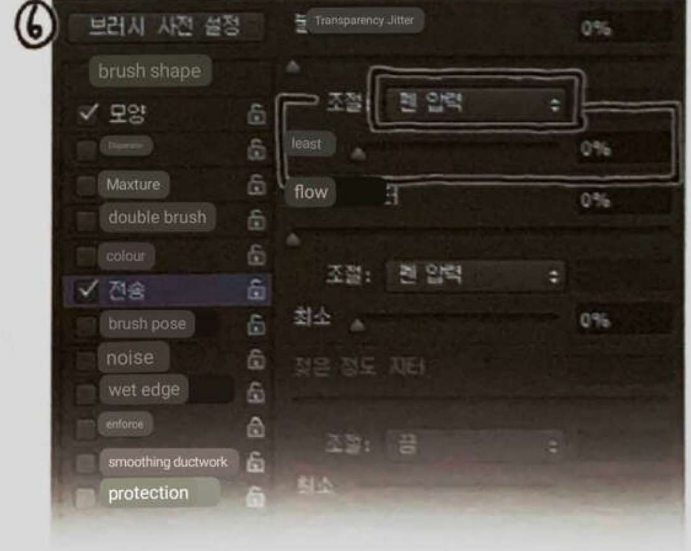
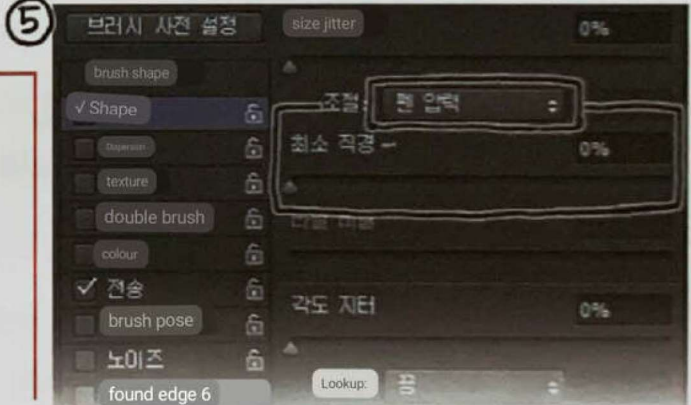
and if it is high, it can be painted without mixing like oil or acrylic.



7 Create a new brush

Saves the current brush settings as new.

Saved brushes can be loaded from brush presets.

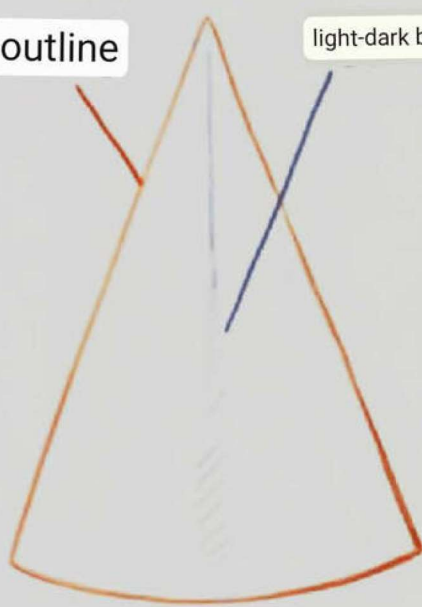


## practice blending

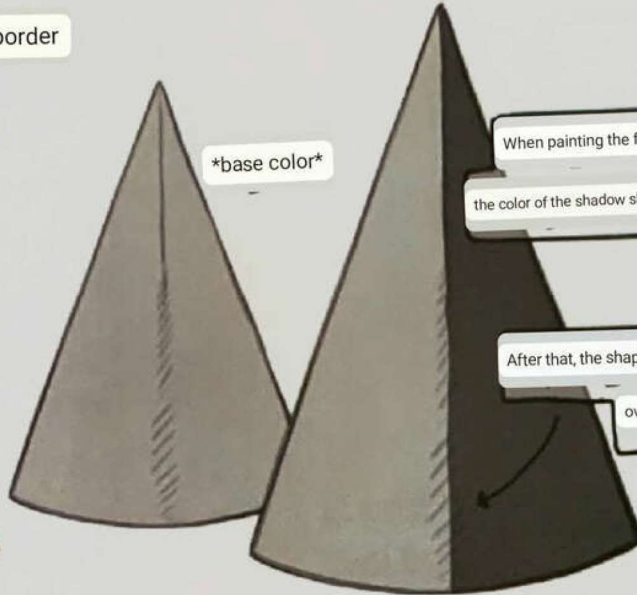
It is not an exaggeration to say that blending is everything in the watercolor method of coloring using a brush. Blending is required anywhere colors are mixed, from the borders of shadows to gradations of color and saturation.

outline

light-dark border



\*base color\*



When painting the first shadow, the direction of the light and the color of the shadow should be well displayed, just like the cell coloring method.

After that, the shape and structure are materialized by painting over the gradation of the light and dark boundary.

Paint the shadow area with an opaque brush to show the light direction. When organizing the sketch, it is convenient to sketch the contrast line along with the outline.

In brush (B) mode, hold down the Alt key and click to draw a color with the eyedropper.

①

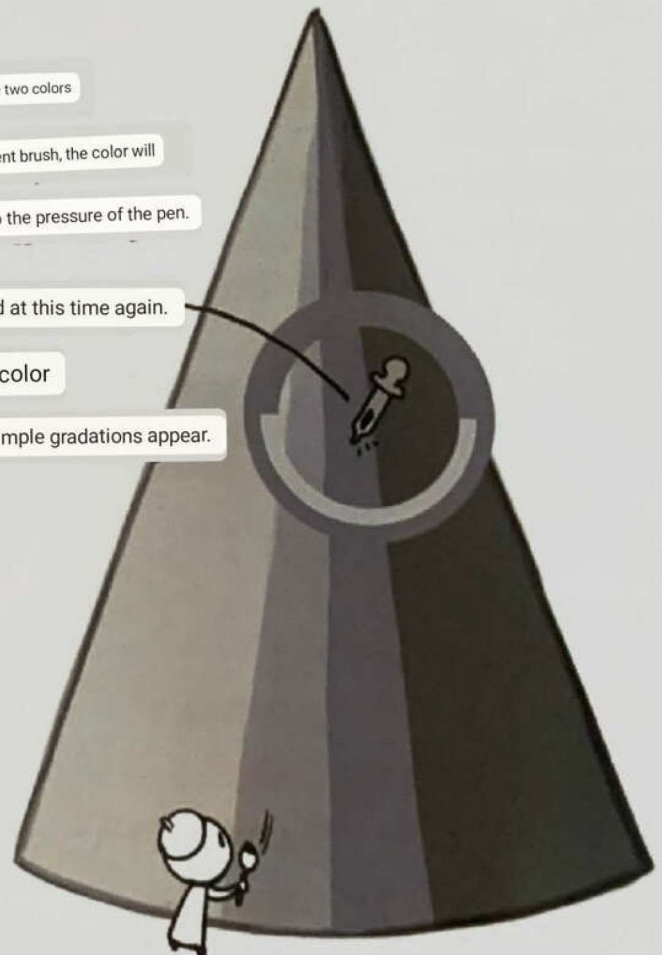
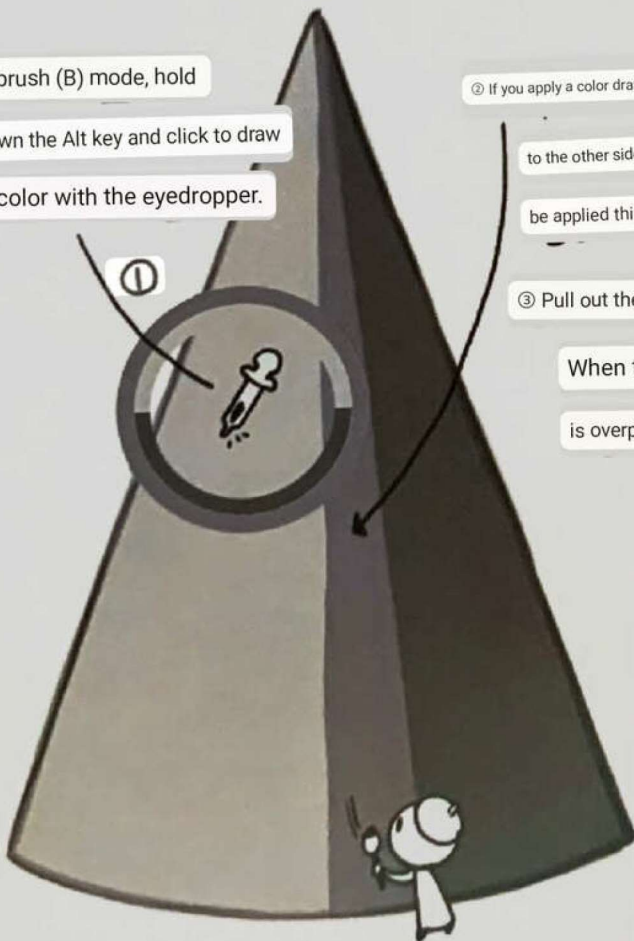
② If you apply a color drawn from one of the two colors

to the other side with a transparent brush, the color will be applied thinly according to the pressure of the pen.

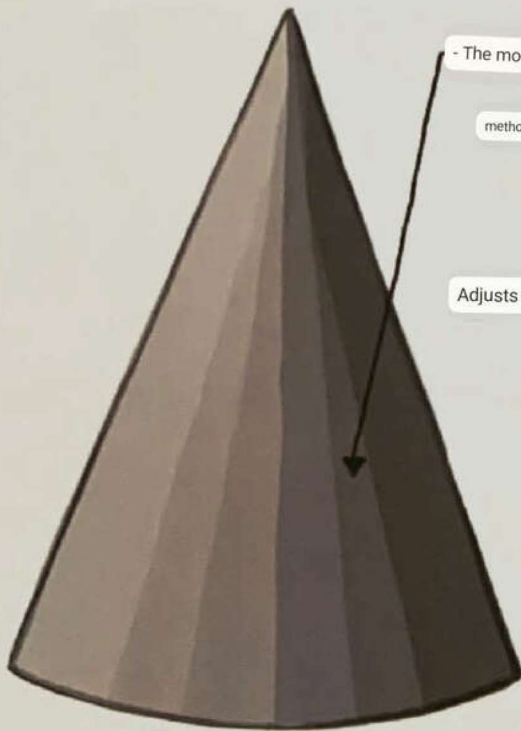
③ Pull out the color created at this time again.

When the original color

is overpainted, four simple gradations appear.

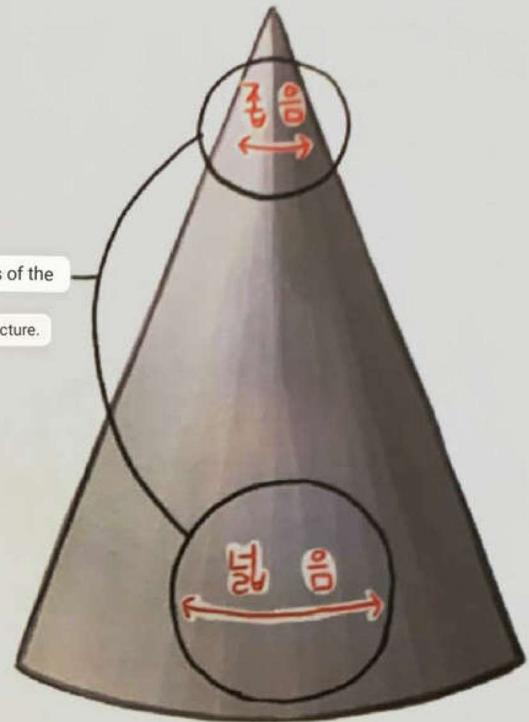
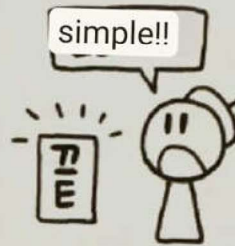






- The more you repeat the same method, the richer and softer the gradation becomes.


Adjusts the gradation according to the kurtosis of the corners and refines the shape and structure.

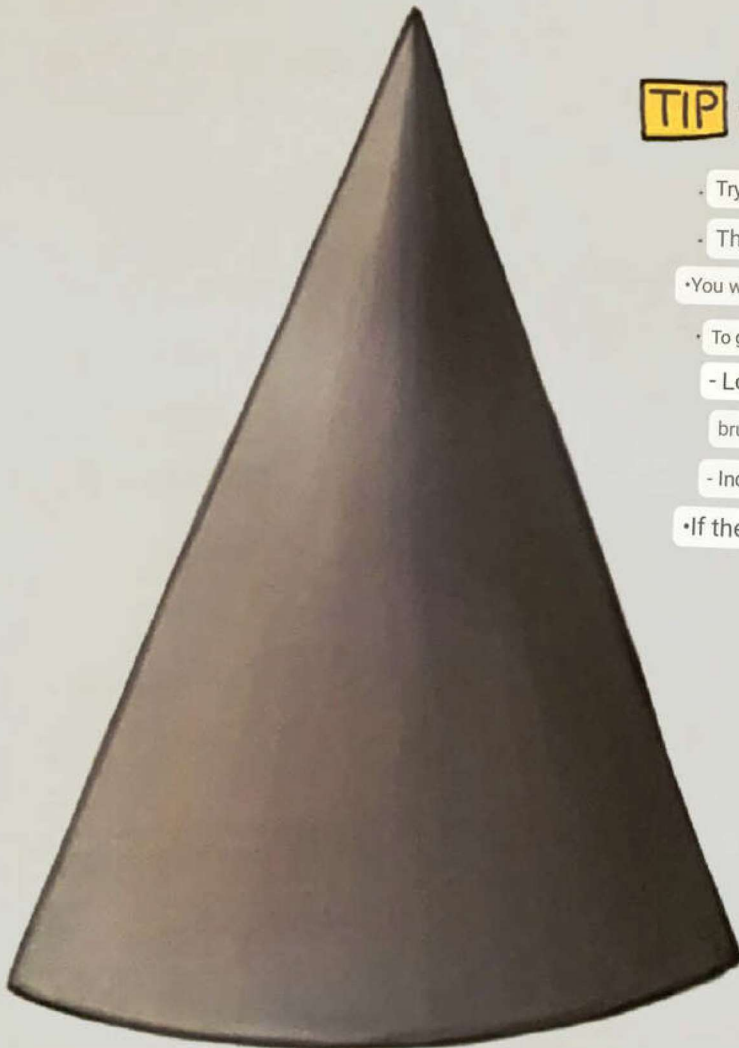


**TIP**



These are my personal tips.

- Try using the brushes in the order of large, soft-small and sharp ones.
- The finger frame is optimized for blending.
- You will press the Alt key very often than you think...
- To get rid of over-touch marks... 
- Lower the opacity of the brush. - Decrease the hardness of the brush.
- Increase the size of the brush.
- If the brush is very small, you can also blend outlines.



for efficient coloring.

Find your own blending tips!

## The order of watercolor painting



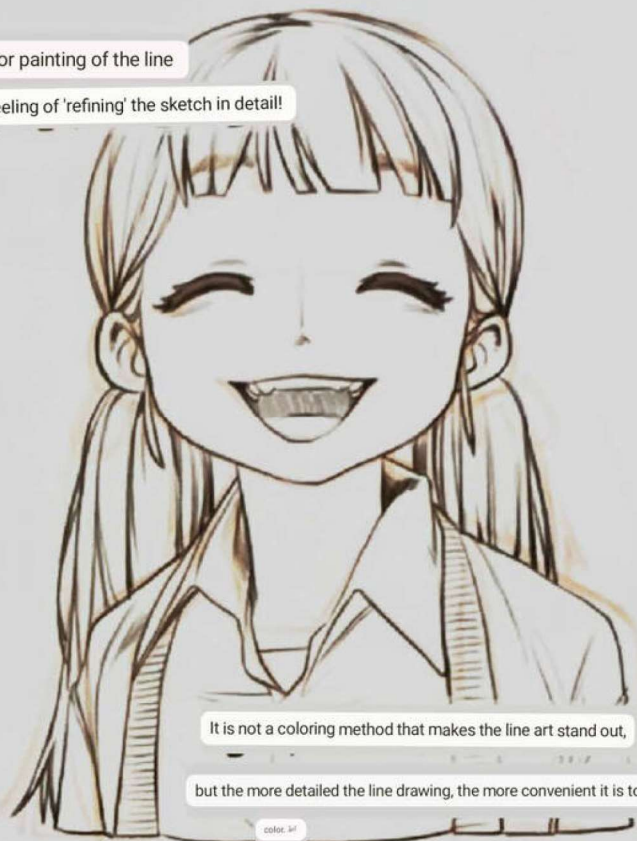
Most of the drawings in this book were painted in watercolor.

If you feel like 'selling'

a new sketch for line art using the cell-based method...

The watercolor painting of the line

art gives the feeling of 'refining' the sketch in detail!



It is not a coloring method that makes the line art stand out, but the more detailed the line drawing, the more convenient it is to

color: 3/1

1. Arrange the line art on the sketch and draw it. You can express the strength and weakness of lines by adjusting the opacity of the brush.



closed shadow



Let's plan the darkening part

or the division of the light

and dark boundary!

Please, the future me! number

2. It is useful to sketch the areas where the shadows gather or the areas

where the contrast is clear with a soft line.



3. After that, in the order of the cell-based coloring

method, even the shape of the shadow is painted.

[For efficient coloring!]

Multiply the dark places...







4. Refine the color of the contrast boundary and shadow. Brush and eraser, two burners



This is useful.

\*The more detailed the color of the shadow is designed in the early stages of coloring,

the more efficient the work becomes as the subsequent coloring stage can only focus on the blending of form and structure.





5. If you change the color of the line art and combine the line art,

It appears in a darker color than the base color.

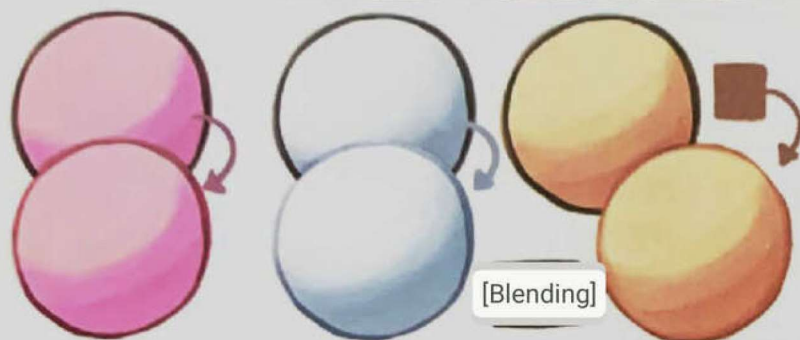
Blending the colors that appear at this time will give you a richer description.



object color

shadow color...

For skin, red is recommended:



[Blending]

Blend the large

and gentle structure first with a large brush,



Blending details

and outlines with a small brush!



6. After that, color and color are blended to express the three-dimensional effect in detail. Large brush (large curve) → Small brush (fine curve) is recommended.

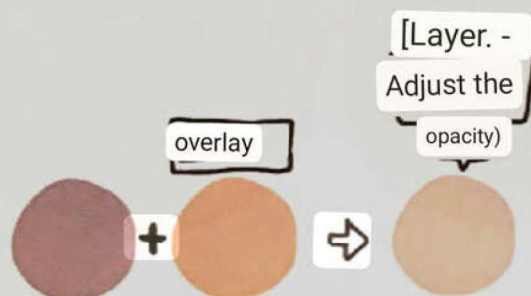
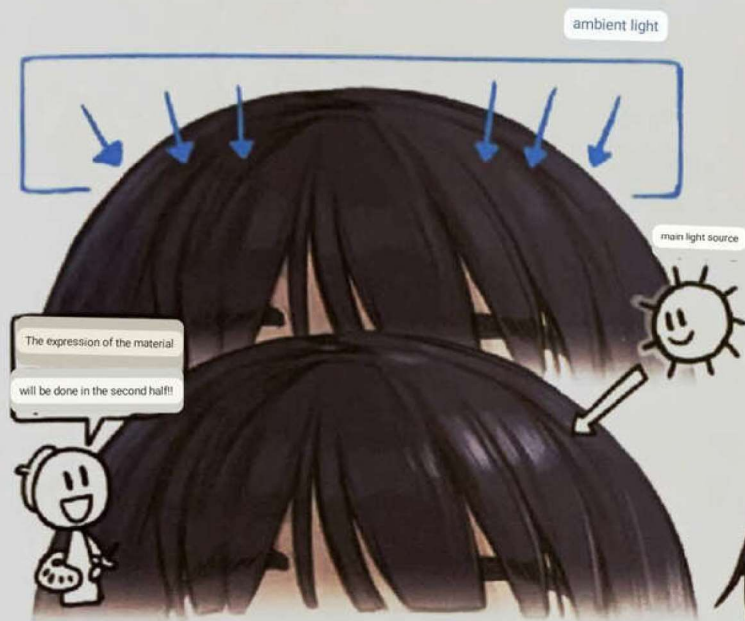


7. Color with a large, soft brush from the specular of wide and

weak light (ex, sky, ambient

As the brush gradually becomes smaller and more opaque,

light). Colors bright and vivid speculars.



8. In the watercolor painting method, the saturation decreases as the colors

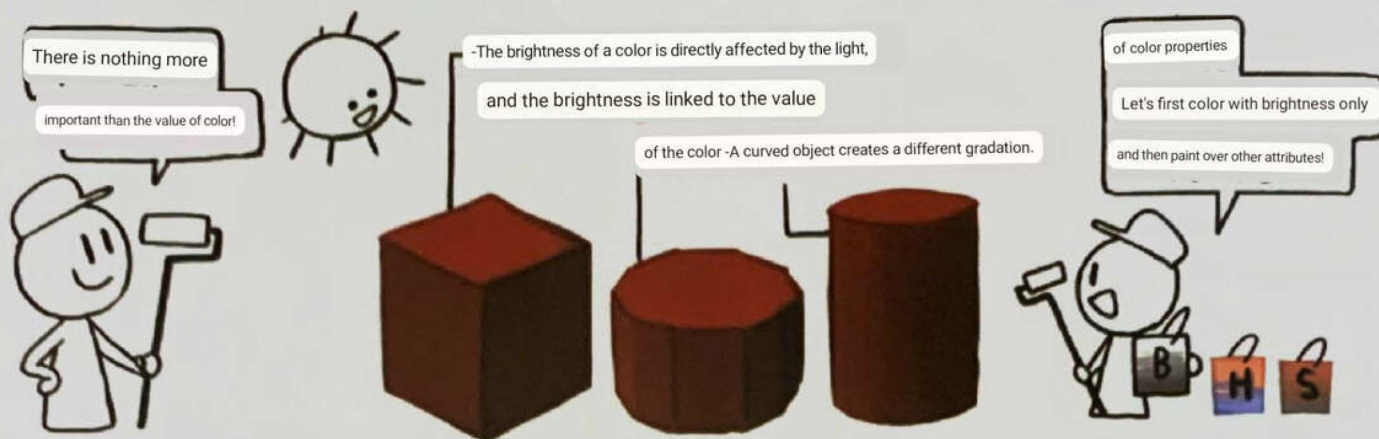
are blended, so increase the saturation using

overlay composition. Afterwards, with a very small brush, I add

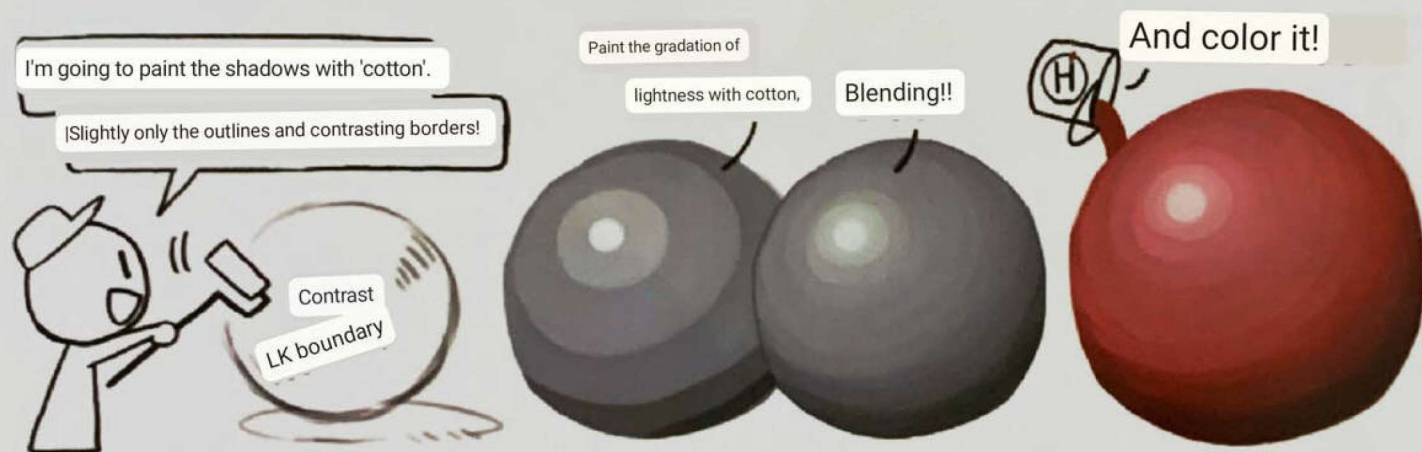
detail and clean up the depiction and finish it off.



## ③ Glazing Coloring Method



The glazing coloring method is a technique in which the highlights and shadows displayed by light are colored only with the gradation of the brightness, and then the color is added later. The three-dimensional effect can be expressed dramatically because it intensively depicts the value of highlights and shadows, that is, the lightness and darkness of colors. Because the shape and brightness of the shadows are given priority, the line art does not appear well, and for this reason, it is mainly used for realistic depictions.



By focusing on the shape of the shadow rather than the line, the three-dimensional effect is maximized, and the more you practice, the stronger the form becomes. In general, the work is faster because the line art is omitted and only the brightness of the color is adjusted. 1)

Form Power: The ability to recognize and express a three-dimensional shape in an object.

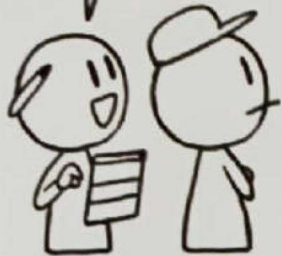


Colors cannot be colored intuitively because they are mixed and painted over an achromatic picture. It may be difficult for beginners to describe a three-dimensional effect only with the brightness and shape of the shadow without relying on the line drawing.



In digital painting programs such as FT Shop, you can use the layer compositing function to paint over colors in various ways.

Actively use  
layer compositing!



gray object + overlay



### ► Volume first

- First describe the sense of volume with an achromatic object, then

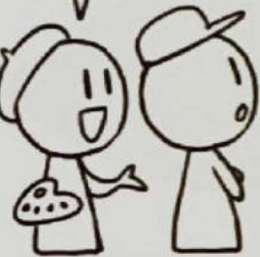
This is a method of adding colors with overlay composition.

- Since all of the hue, saturation, and lightness of a color are

You can color it intuitively.

synthesized, it is necessary to describe additionally after painting.

Traditional technique used  
in oil painting!



Value coloring + color



### ► Value first

- Coloring with black and white images considering the value of color,

It is a method of coloring by adding color and saturation.

- Because the value of color is prioritized

Vivid colors appear.

- It is difficult to color because it cannot

be applied intuitively.

Although the method of coloring is different, the order of coloring the gradations of brightness is similar, so you can proceed according to your preference when adding colors.

## Glazing technique of TMI oil painting

Originally, glazing is a method of painting with light and dark gradations of the paint color and coloring with red paint by increasing the amount of oil while the paint is dry. Because of the large amount of oil, the paint does not cover the base color and is transparently accumulated, and the base color and the over-painted color are densely overlapped. Most of the paintings in Western art history that we are familiar with used the glazing technique. Conversely, the technique of applying paint thickly is called the impasto technique.

Let's keep the brightness by adding a thin layer of paint!



GLAZING

[Let's paint  
thickly!



DOUGH



'If I do this well, I

think it will be possible

with layer compositing?!"

## Common sequence of glazing coloring method

This is the process of coloring the shadows before adding color.

1. Sketch outlines, shadows, and contrast lines together. It is better to proceed as sketching the contrast as an area rather than a line.  
the area of the shadow

By hatching

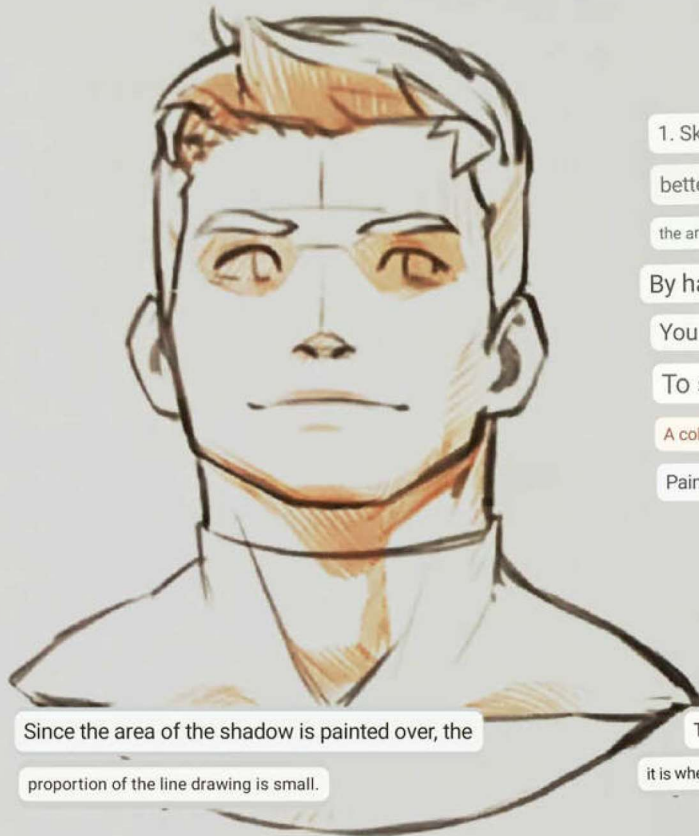


You can sketch. 2.

To synthesize colors vividly

A color with 50% brightness

Paint the base color.



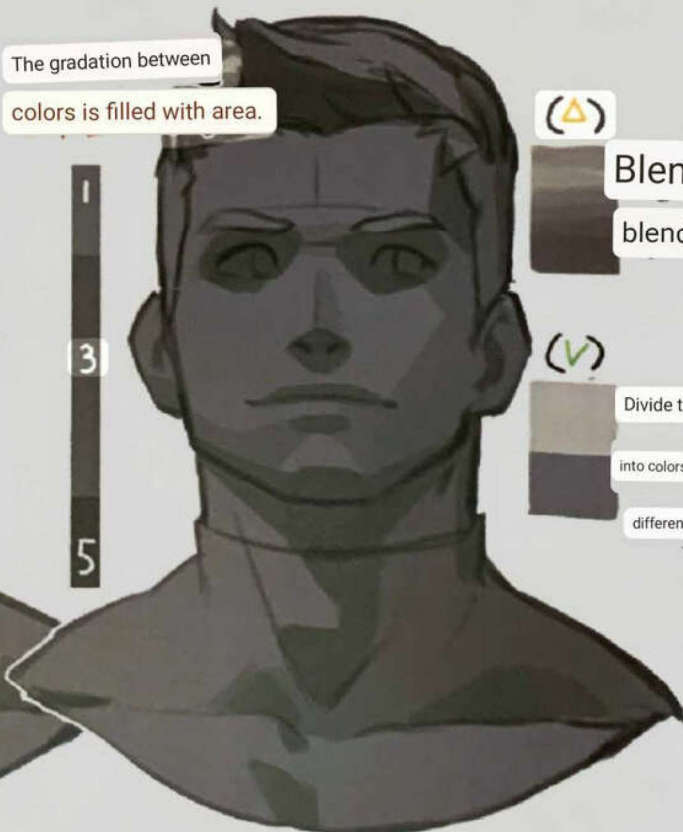
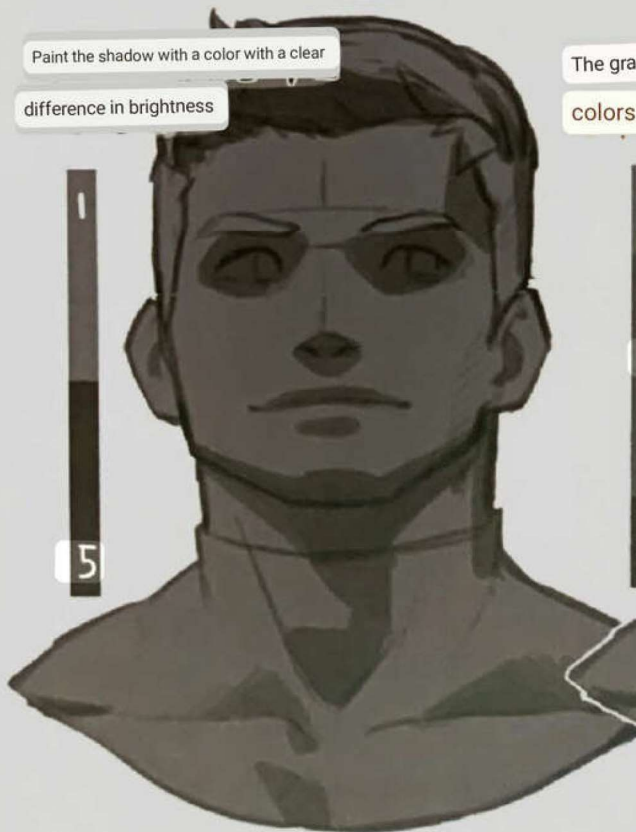
Since the area of the shadow is painted over, the proportion of the line drawing is small.

The color appears as it is when compositing the overlay.



Paint the shadow with a color with a clear difference in brightness

The gradation between colors is filled with area.



Blending

blends colors.



Divide the gradation

into colors with distinct

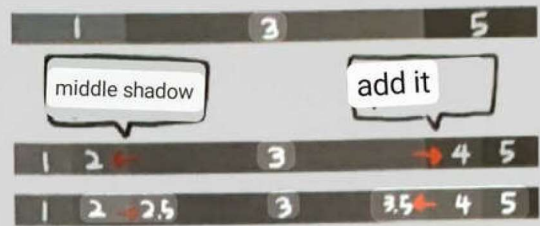
differences in brightness.

3. Sharpen the shadows with the lowest brightness.

4. Describing light and dark levels with grays of light intensity between the two colors. It is better to color with a clear border rather than blending.



5. Describe the three-dimensional structure by further dividing the gradation.



pick the color of the shadow

Gradually paint wider towards the lighter side.

Is it different from blending?

difference in name

Separate by cotton!

Continue to fill the area with medium-light shadows.

6. While reducing the size of the brush

It also depicts the shadows of detailed bends.

From the process of making the shadows

more detailed, I color the borders

with the feeling of removing the line art.

Depicting the small bends inside the shadows...

Divide the contrast

boundary by the difference in the brightness of the shadow.

Spread!

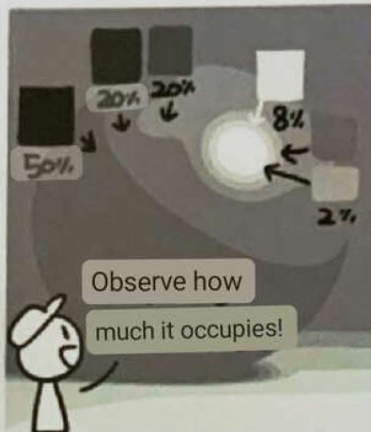


## practice with a mockup

It is difficult to intuitively observe the difference in the brightness of the shadows because the round-shaped object has a soft gradation.

Let's practice using Photoshop's filter function to correct an image and color it with an area.

Separate colors by adjusting the number of levels.



Even if it's a bit awkward, try painting on one side



1. Correct with Filter - Artistic Effect - Crop.

2. Observe the ratio of gradation and describe it as an area.

Describe even

small curves



6. The smaller the brush, the

It depicts three-dimensionality

It also expresses small differences in color brightness.

as much as possible with small structures.

Don't miss the small difference in brightness!





Leave the

sharp curves intact...

Round curves

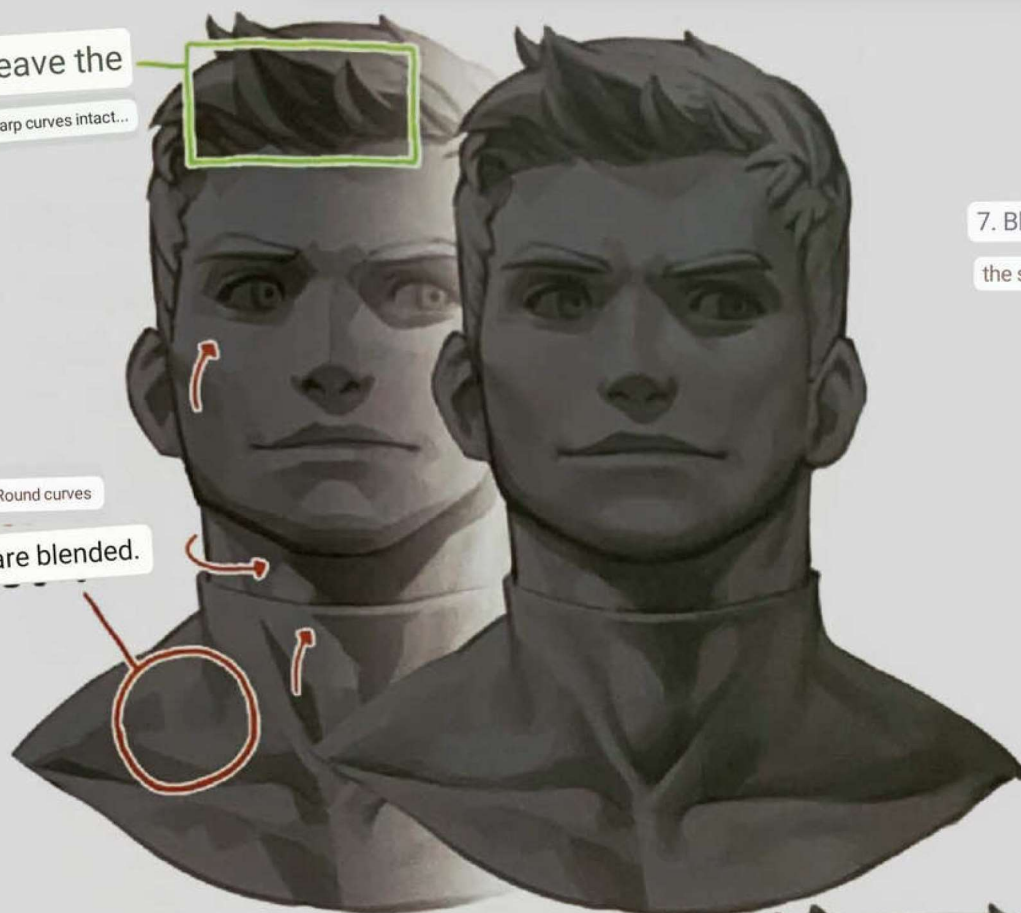
are blended.

7. Blend the colors with priority on  
the smooth surface.

This process is

the same as the

watercolor painting method.



8. Finish the depiction by  
adding detailed structure  
with a transparent brush.

fine hair,

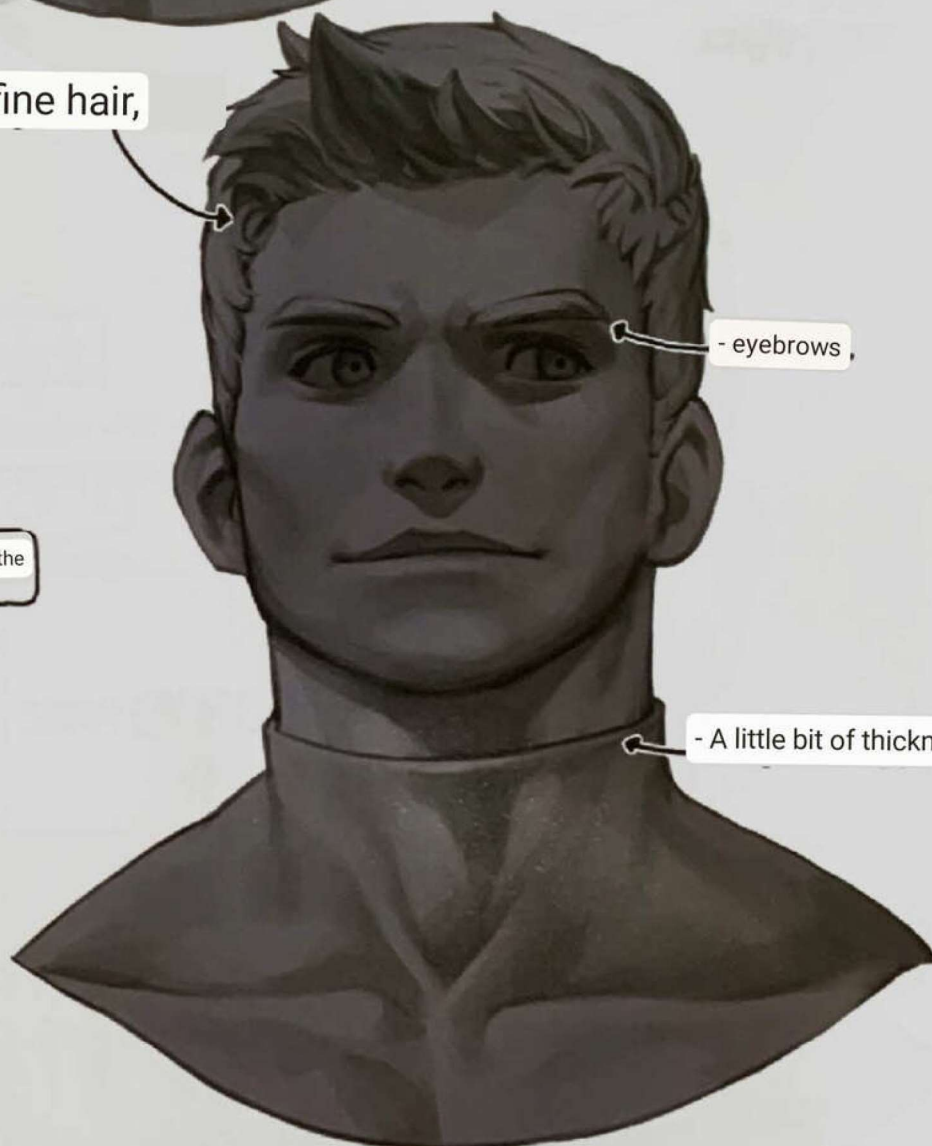
- eyebrows

- A little bit of thickness...

Up to this point, the basic drawing method is the  
same, but the coloring method is  
different from the process of adding color.

The three-dimensional

rendering proceeds as much as possible here!



## volume first



When compositing an overlay,

the over-painted

color is synthesized as it is.

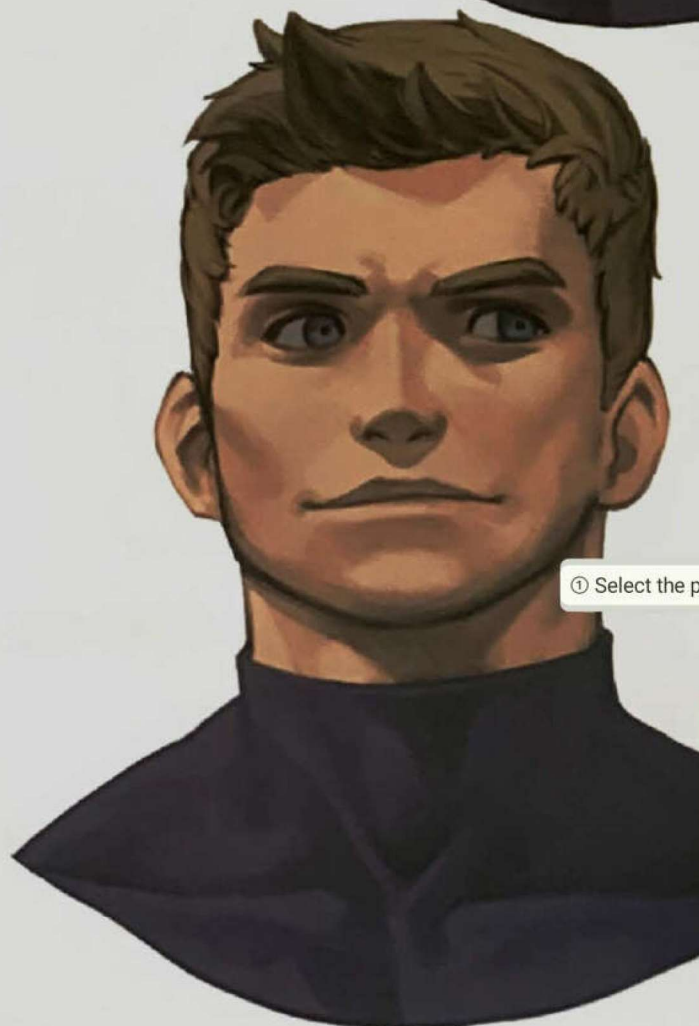
1. Using the clipping mask function, add the

color you want to

paint over as an overlay composition.

In gray at 50% brightness

The over-painted colors are clearly visible.



2. To correct the color to be overpainted

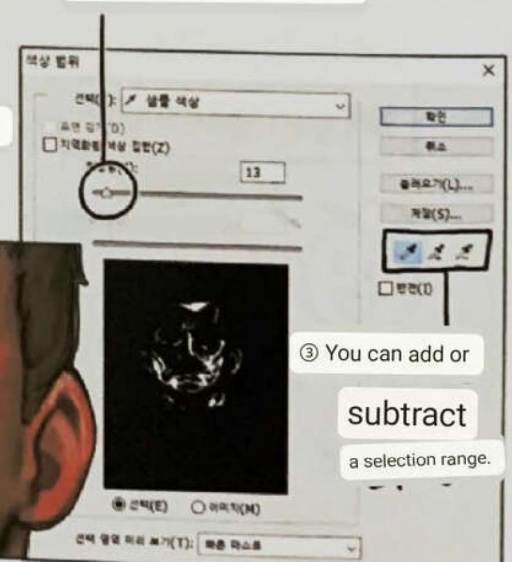
Select → Select an area by color range

and adjust Hue/Saturation.

C+H+U

② Adjust the allowable amount.

① Select the part to adjust the color

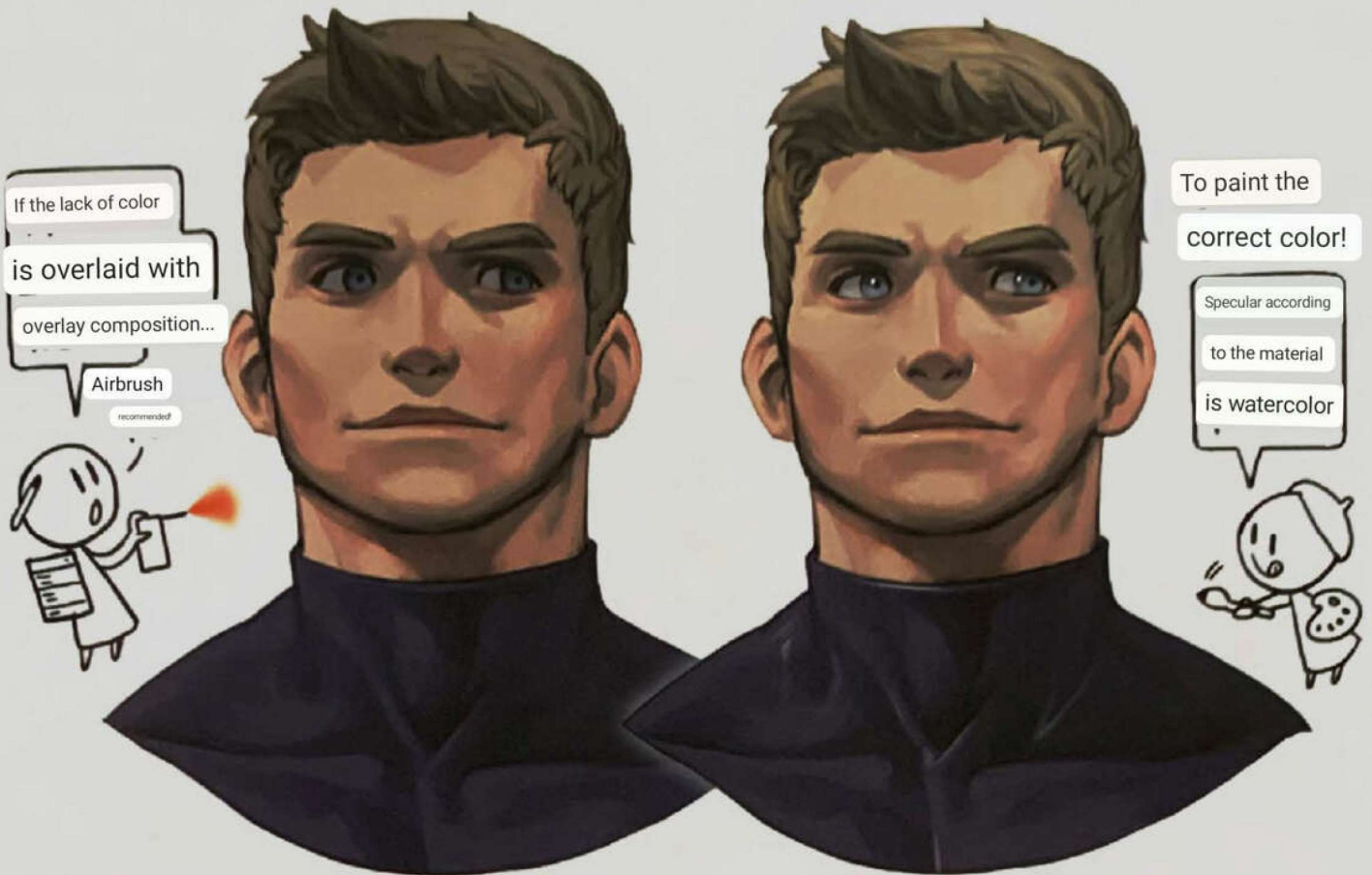


③ You can add or

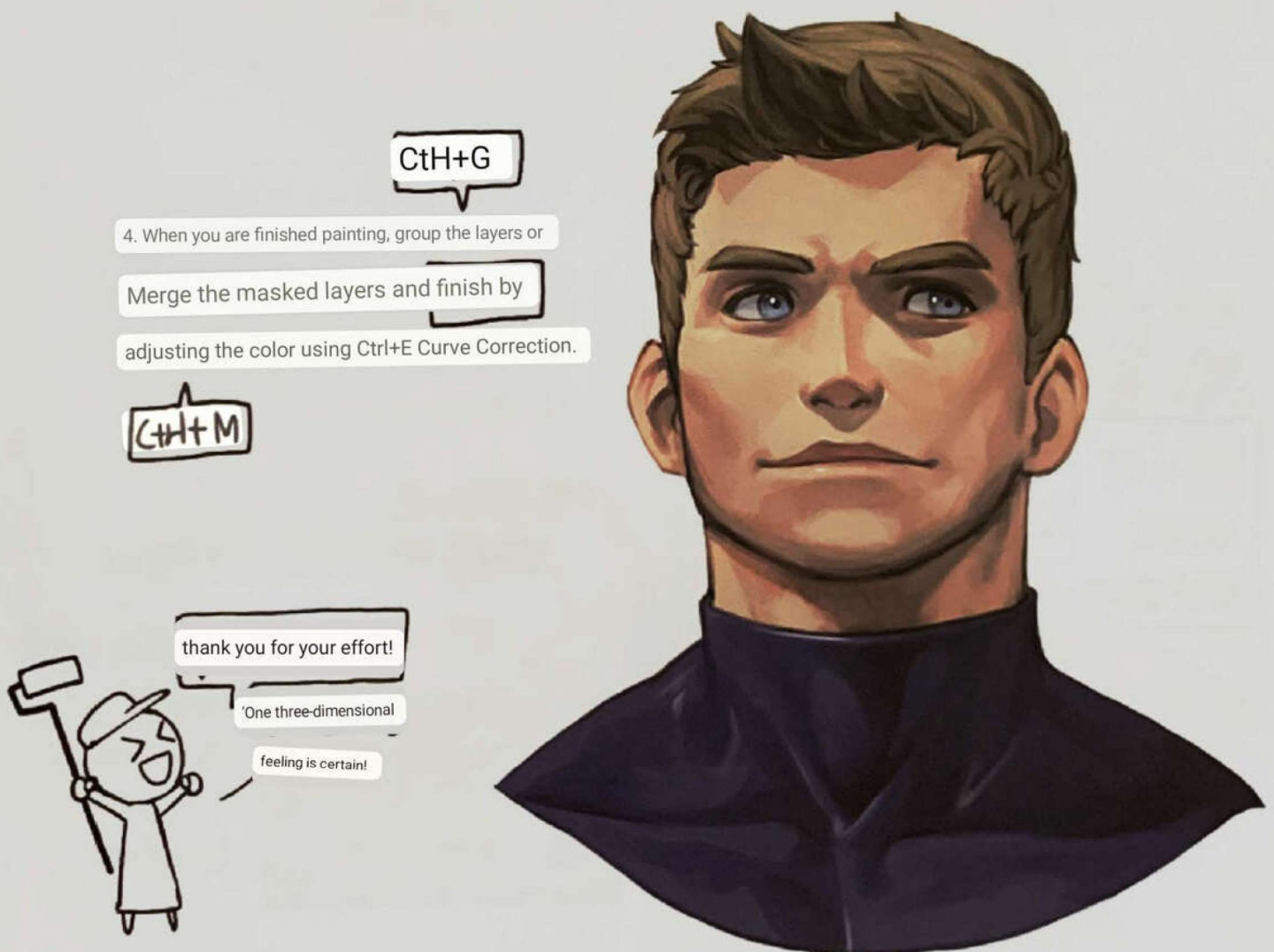
subtract

a selection range.





3. Correct the lack of color with overlay composition, and the specular color is directly overlaid with a watercolor method.



## value first

dark color.

very dark

Specular is

also a value~

1. Adjust the brightness of the gray based on the brightness, that is, the value of the color you want to paint. Lasso the area and use curve correction. 2.

Color the specular shape and brightness while matching the values. Adjusts the brightness by considering only the illuminance of the incident light.

for a moment!

this color

You can't

paint intuitively.

3. Clipping mask the new layer

Change the layer blending option to Color.

After that, the color you want to paint over

Adjust only the Hue and Saturation.

Describe while adding color.

- What color (hue)

, Decide how much to fill (Saturation).

-Achromatic colors (white, black)

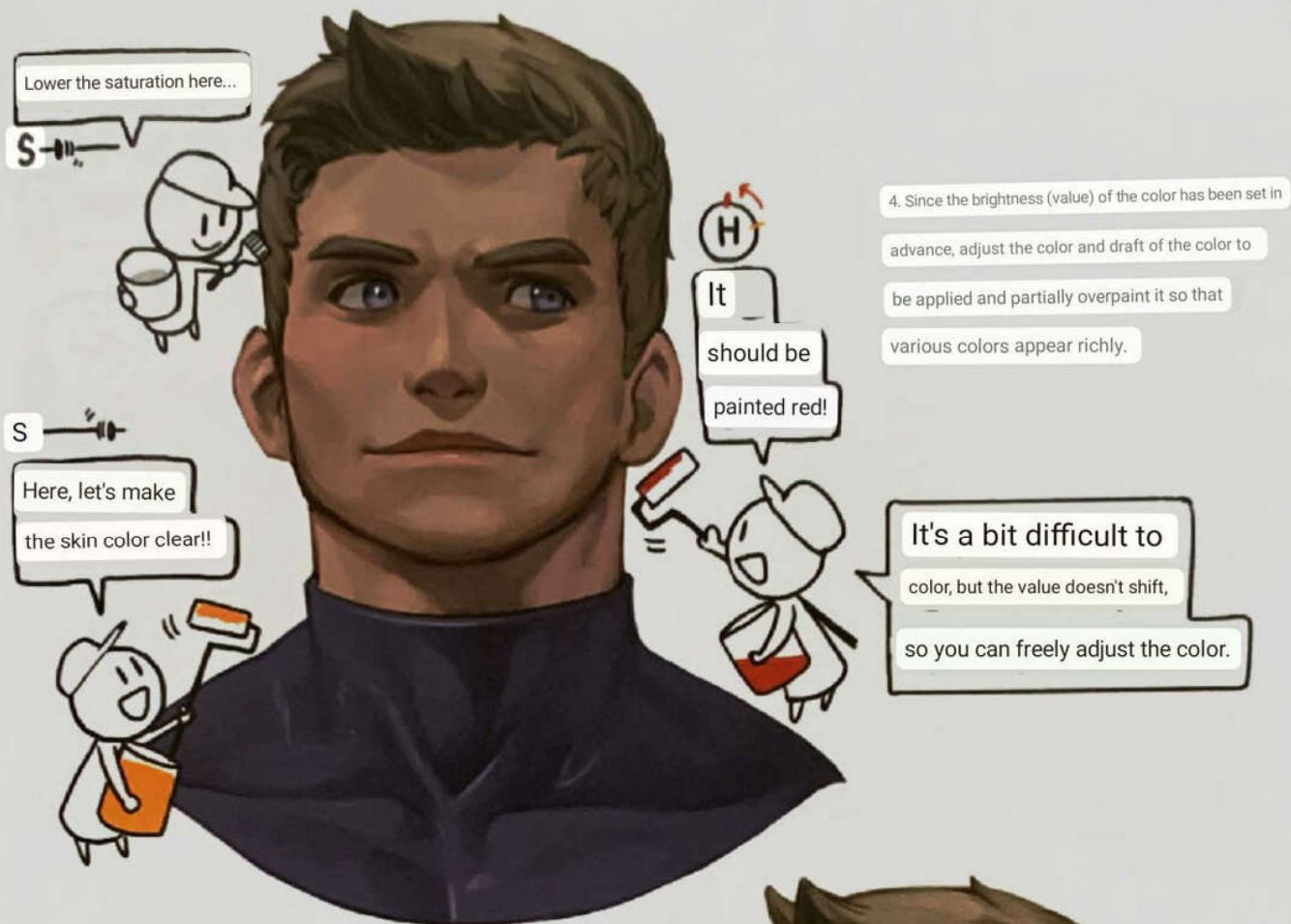
become less saturated

Brightness is 100%

keep it fixed





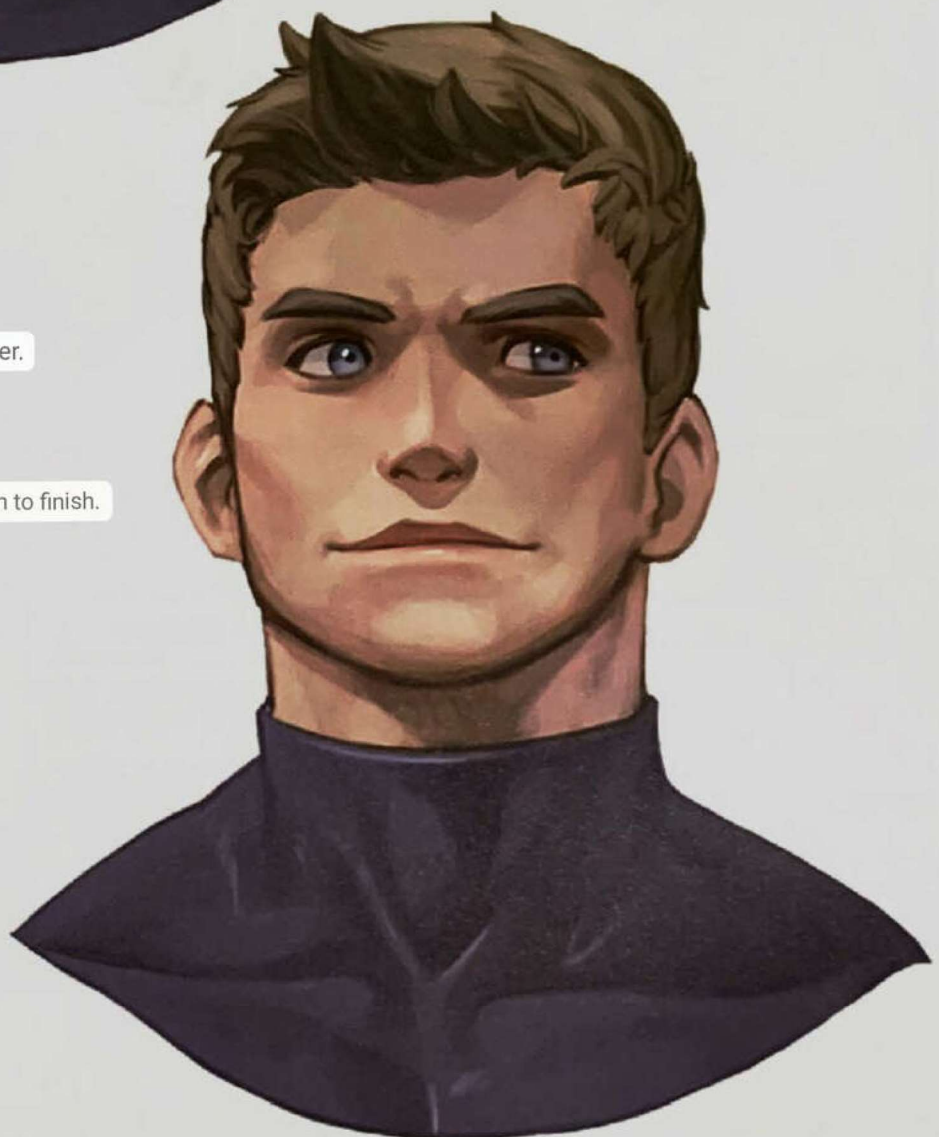


5. Adjust the color value on the gray layer.

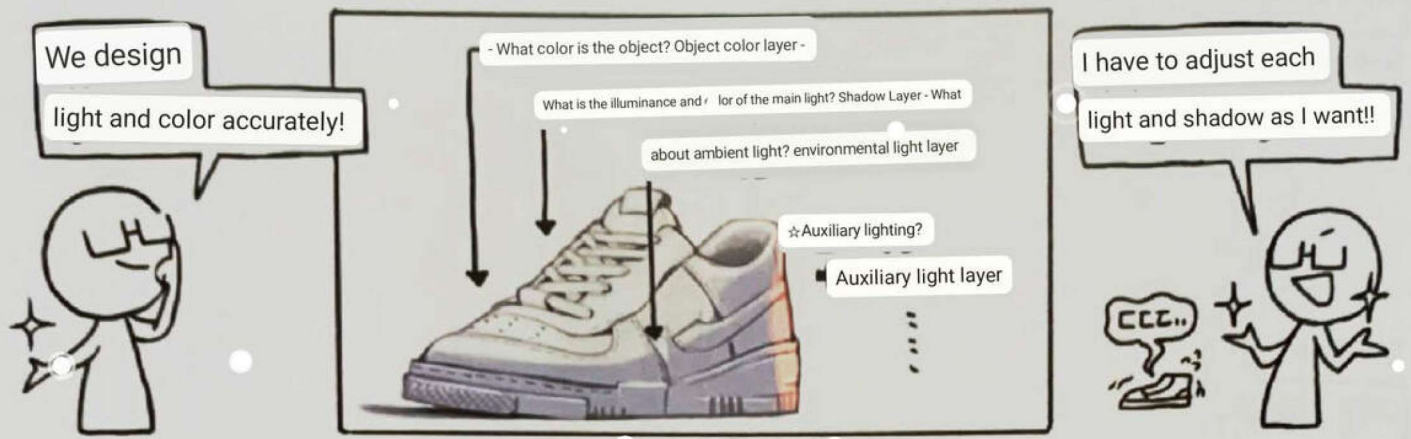
Similarly, when the overcoating is

finished, group or merge the layers

and adjust the color using curve correction to finish.



## ④ Render



Rendering is a technology that sets objects and lights in a virtual space and makes the colors appear according to the desired lighting. In general, it is used to draw the appearance of 3D space, and the computer processes the light calculation, so the color is very accurate.

Although it is a bit far from painting-based coloring, by controlling the process and method of making color appear, you can draw a very realistic appearance.



Rendering manages various light, shadow, and optical phenomena in separate layers, so it is very convenient to modify lighting.

Creating an image by compositing layers is called compositing, and the correct color appears according to the numerical value.



However, managing each layer requires a high level of knowledge about light, and insufficient knowledge soon becomes an unnatural expression. In addition, since it is a color created by the drawing of a computer rather than paint, the originality and unexpected charm that only paintings have may be lacking.





Rendering is...

It is a completely different  
approach from general digital

painting, but because of its very easy to modify features

- it is applied in a variety of ways.

Let's change the object color.



However.

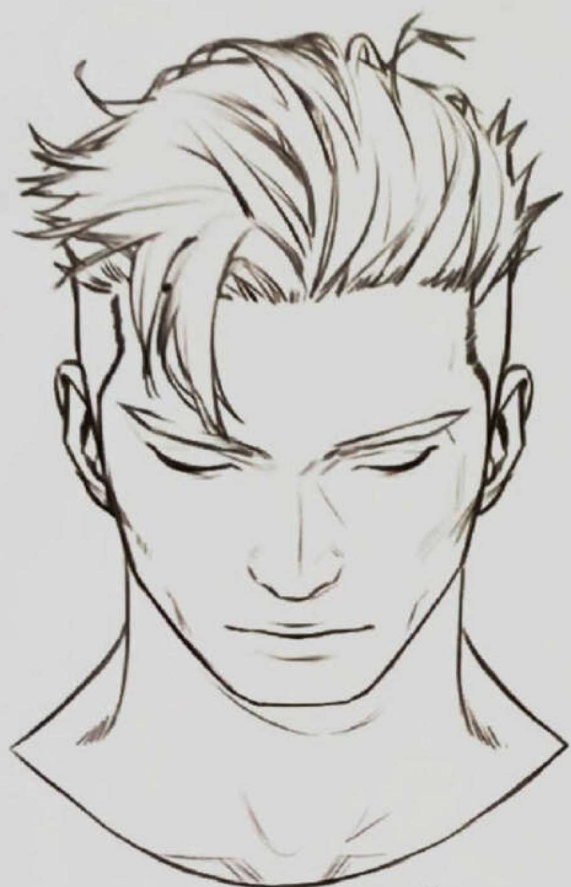
It  
takes a very long  
time to prepare...



## Basic preparation for rendering

In the 3D rendering program, the channels that are synthesized in the image according to the operation of light are called multi (Marpass).

There are many different multi-passes, but let's look at the channels that are suitable for compositing in a painting program like Photoshop.



It's optional,

but the more neatly you use it, the better!

0. Line art (standard, multiply, etc.)

•In general, sketches or drawing line art are not used in rendering.

However, you can use lineart depending on your coloring

style. They often act similar to closed shadows.



1. Silhouette Mask

The area where the image to render the layer

will appear. Since there is no light, it appears completely

black. Any layers added after that will appear beyond this silhouette.





## 2. Subsurface Scattering (Screen)

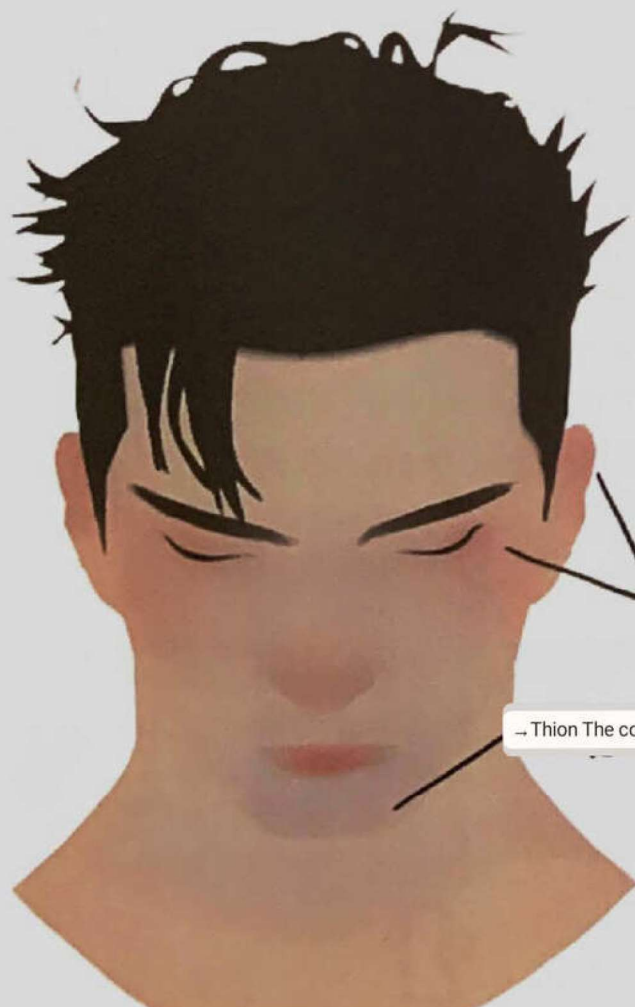
Synthesizes the surface lightening from the

underside of the surface before rendering the colors that appear on

the surface. The skin appears reddish when exposed to strong light. Shadows

that do not reach light and objects that do not exhibit subsurface scattering

Composite in black so that no change appears.



## 3. Diffuse reflection (screen)

The color of the diffuse reflection that shows the color of the surface of the object well is synthesized

with the screen. When modifying the object color, be sure to change it on this layer.

→ The thin skin is red.

→ Thion The color is somewhat bluish.

apart from the light

The layer that determines the color of the object!

You will find it often...





#### 4. Cast Name Shadow (Multiply)

The parts that are brightened by the light are

white, and the shadows that do not show diffusely reflected colors are combined with

black. We need the shape of the shadow, so we need to use a brush. If you want to

change the color of the main name, make corrections on this layer.



Because it aims for a realistic expression

The cell watercolor method is somewhat inappropriate for shadow depiction.

(TH+J)

#### 4-1. Main Name (Screen, Linear Dodge)

If the illuminance is stronger, duplicate the layer above

and combine the duplicated layer with screen (weak) or linear dodge (strong).

Adjust the illuminance with layer opacity, curve, or level adjustment.

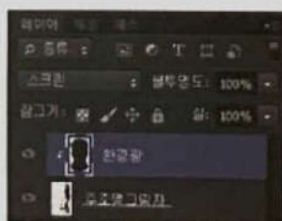


#### 5. Ambient light (screen)

Except for the corners, I color it with the light of the ambient light.

The environment is wide and weak light, so you need to color it with a darker and turbid color than you think. If you want ambient light to shine on shadows that

the cast name couldn't, clip this layer to the cast name shadow layer to light the shadows.



When clipping to the shadow layer, the ambient light is only applied to the shadow...

The surface volcanic

scattering layer doesn't brighten...



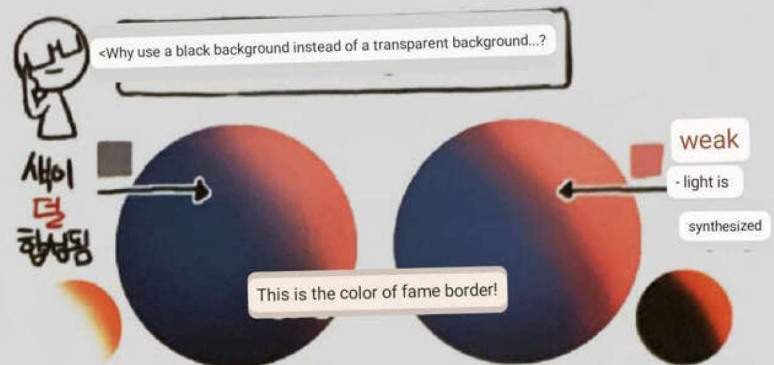


## 6. Auxiliary Lights (Linear Dodge, Color Dodge)

The part brightened by the auxiliary light, not the main name, is synthesized as a dodge series.

Paint the background black and make sure the areas that are not illuminated by light remain unchanged.

The intensity of the light is adjusted by curve or level adjustment.



Dodge-based compositing cannot be illuminated with layer opacity, as you need to paint with a dark color rather than a transparent color to add light with a weaker illuminance.

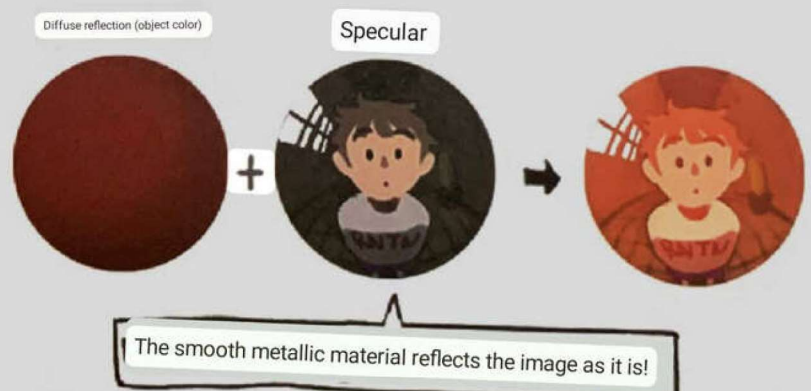
## 7. Specular (Linear Dodge, Color Dodge)

Color the speculars, which appear as specular reflections of the material, on a black

background and composite them with a Linear Dodge or Color Dodge.

Color Dodge is mainly used in lighting composition where the color of light is vivid, and

adjusts the brightness of the specular by the brightness of the color instead of the opacity of the layer.





#### 8. Closed Shadow (Multiply)

Darken corners and crevices where no light can shine. A shadow that usually acts similar to a line drawing.



Line drawing (corrected)

closed shadow



The color is decided...

Now let's  
finish!!



► If all layers are placed in order,

color appears according to the operation of each layer.

Detailed parts can be supplemented by coloring directly.

thank you for your effort!

Even if you don't use rendering,

if you have a useful compositing method,

try applying it to the coloring method!

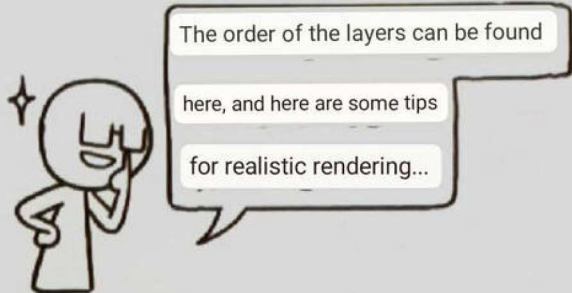
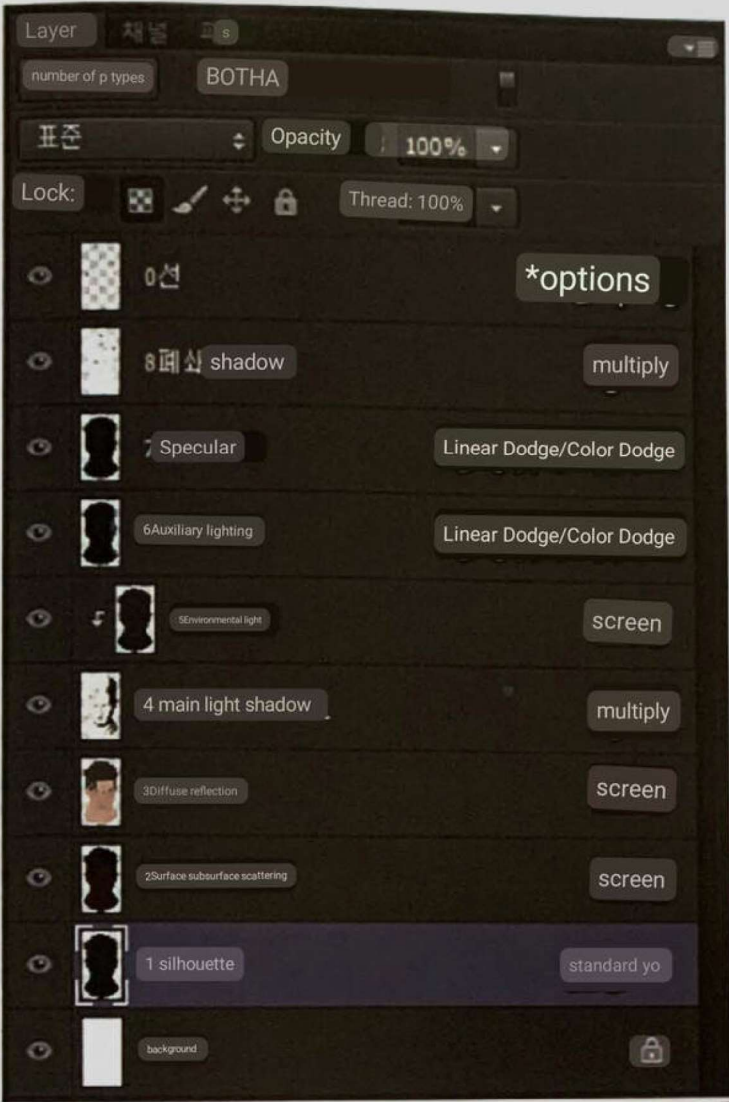
Nani





► Layer arrangement order & adjustment

Photoshop is not a program optimized for compositing, but with good layer control, realistic rendering is possible.



← Adjust the specular to match the illuminance and color of the main light.

← ← You can add multiple auxiliary lights.



← Set the standard of the appropriate illuminance to white, and add it by multiplying the color of the light. Duplicate the layer and screen compositing to increase the illuminance.

← L The object color can be changed on this layer.

\*It is more convenient to use a layer mask.

The process is a bit difficult)



► When this image appears, the masking is over!



((H+V.DI) ... then refine the mask.

PART 08

tutorial





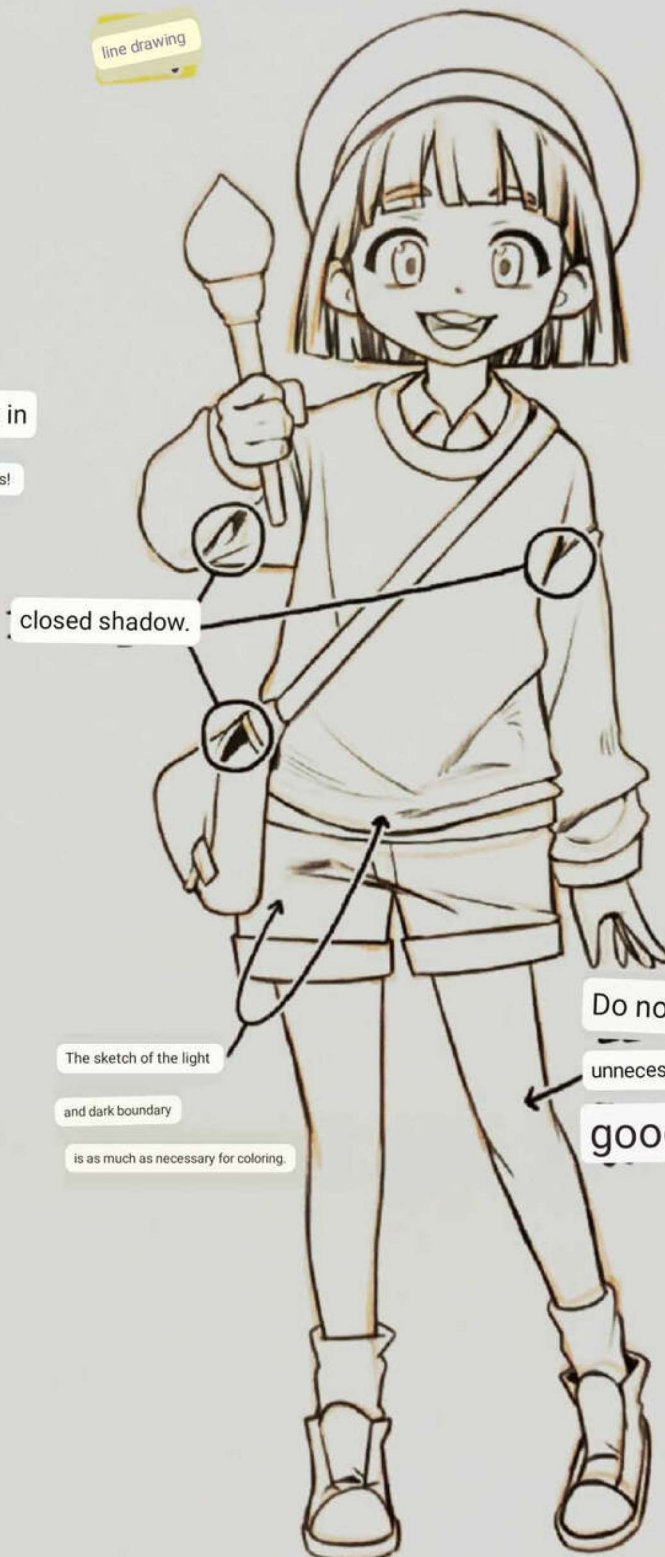
## 1\_ Basic character coloring

sketch



No corrections in  
the line drawing process!

line drawing



closed shadow.

The sketch of the light  
and dark boundary  
is as much as necessary for coloring.

Do not draw  
unnecessary lines  
good

Sketch: Sketch the character you want to draw. I draw carefully so that there is no correction during the line drawing process.

Line drawing: Draws a new line based on the sketch. Draw outlines and closed shadows clearly, and add only as many contrasting borders as necessary.

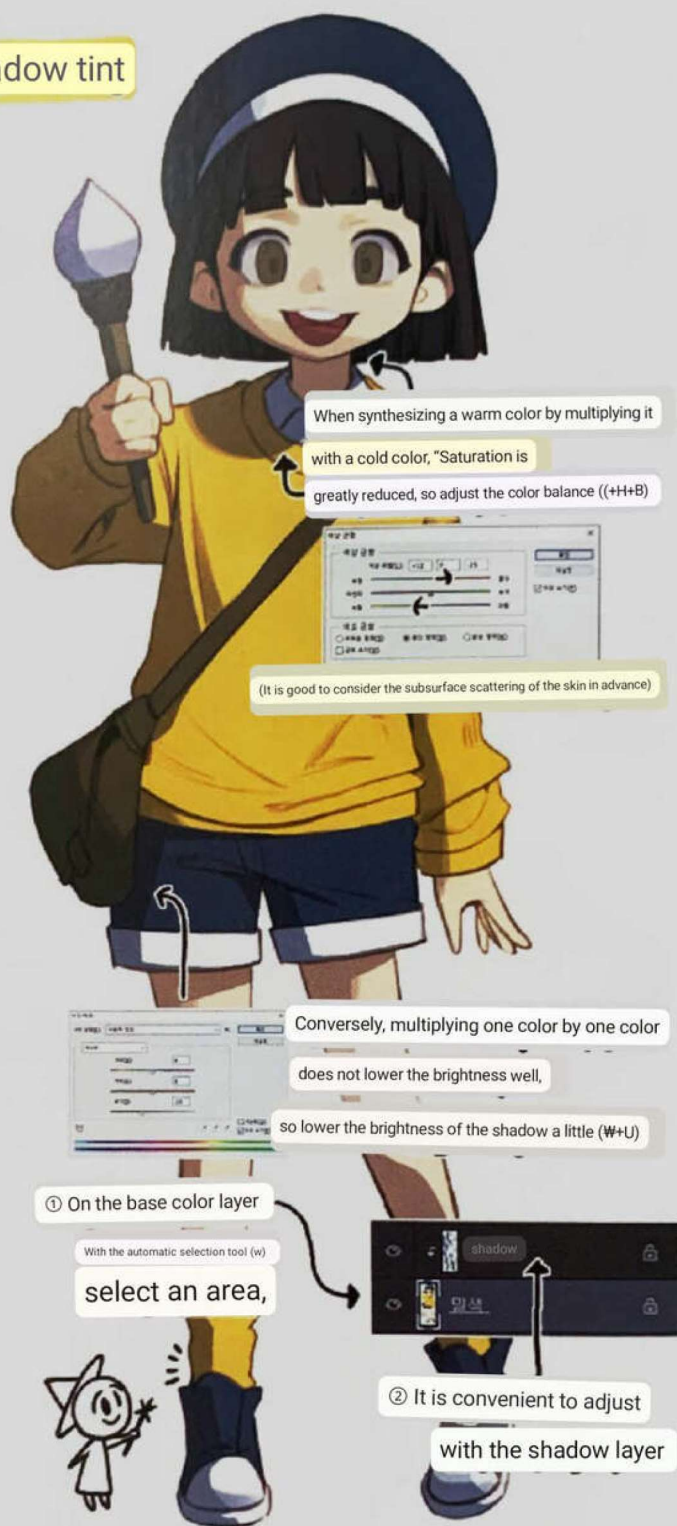




## shadow synthesis



## shadow tint



Shadow Blend: Multiply the shadow layer and paint it with the color of the environment to make the color of the shadow appear.

Shadow Color Adjustment: Partially corrects the color of the shadow.

It is convenient to select an area on the base color layer and adjust it on the shadow layer. At

this stage, the color of the line art is also painted in the same way (1) and combined with a linear burn.



Blending: Colors the gradation at the border of light and dark, and describes the shape in earnest.

It blends the light and dark borders with the highest priority, and refines the shadows according to small curves.

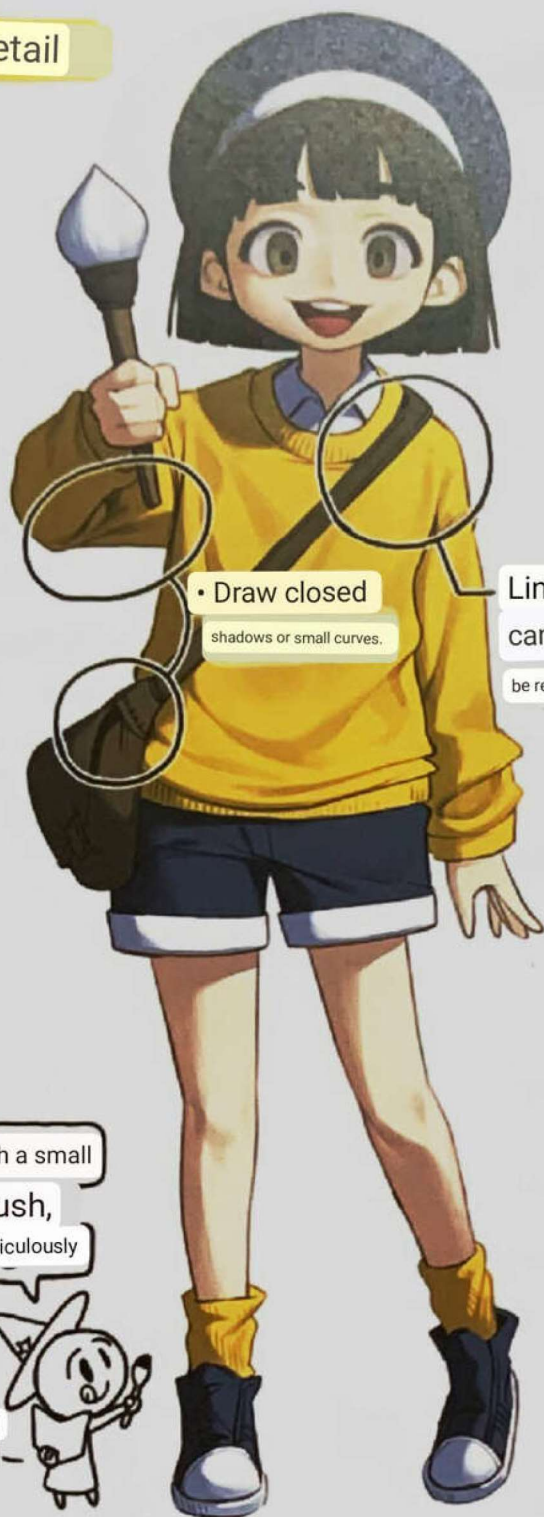
Additional Shadows: Additional depiction of curves inside shadows and curves in highlights. It is

recommended that the additional shadows in the highlight appear brighter than the existing shadows.

- This process takes up most of the total coloring time. Fighting!



## detail



• Draw closed shadows or small curves.

Line art can also

be refined by blending.

With a small brush, meticulously

second

indirect light



The closer the reflected light is, the more 'clear'.

- High-reflectivity materials are vividly colored

environmental light

It is illuminating

the shadow as a whole without a specific direction.

Detail: After describing the overall shape, use a small, sharp brush to refine the detailed curves and shadows. As the brush

becomes smaller, outlines and closed shadows that were drawn with lines can be blended somewhat. The

three-dimensional expression is finished while neatly arranging awkward or rough expressions.



Indirect Lighting: Color with a large brush, starting with wide, weak indirect lighting. (Environmental light, reflected light,

etc.) The texture of the diffuse reflection is very weak, and the smooth texture is painted rather clearly.

At this time, the part not illuminated by indirect light remains dark and is expressed as a closed shadow.

## Specular



## Finished

additional material



Specular: Colors the specular with a smooth texture vividly.

Materials with rough textures (eg fur, stones, etc.) do not color the specular.

Additional materials: Small patterns or optical phenomena utilize layer compositing.

Additional decorations can be drawn to compensate for the lack of depiction.



1 pattern (multiply, standard)



Subsurface

Scattering (Overlay)



## 2\_Character Coloring: Light and Materials

sketch + line drawing



base color



**Sketch+Line Art:** Draws line art neatly based on the sketch. Separate the character and the background and draw them. It is convenient to work with very small metal decorations painted black.

**Base color:** Apply the base color in the same way as before. The background is painted with the most representative object color.

Specularly reflective materials, such as metal, are underpainted with a slightly darker color for effectiveness and presentation.

shadow

① Paint the part that the main light source does

not reach with opaque color,

② Refine the border

of the shadow according  
to the shape.

③ On the round surface,

paint the contrast boundary

with a semi-transparent brush.

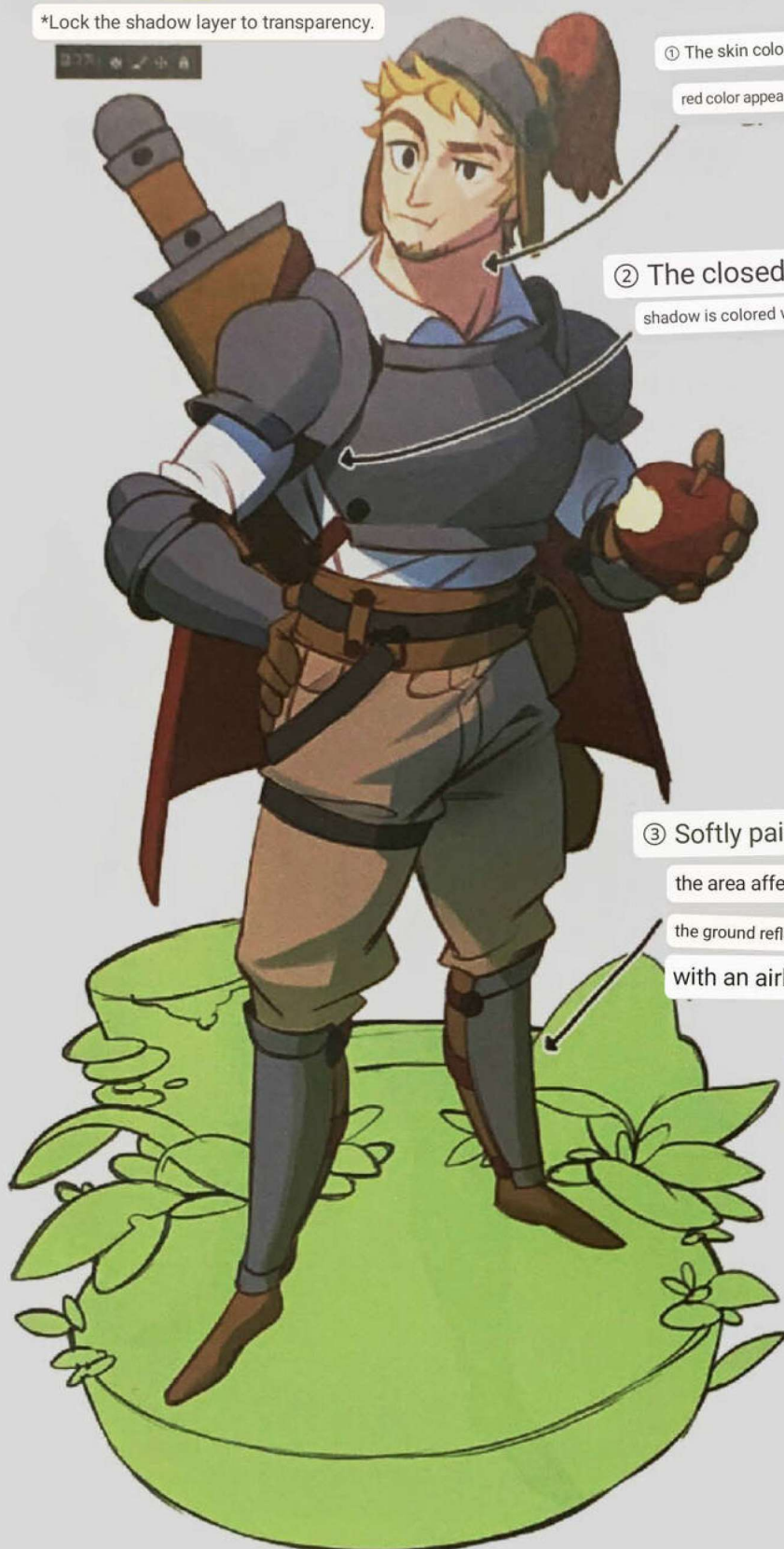


Shadow: Draws a shadow according to the direction of the light. The rounded shape of the light and dark border is also simply colored. In the process of painting the shape of the shadow, it is okay to paint it with any color.



shadow color adjustment

\*Lock the shadow layer to transparency.



① The skin color is adjusted so that a slightly red color appears in consideration of subsurface scattering.

② The closed shadow is colored with a darker color.

③ Softly paint the area affected by the ground reflector with an airbrush.



Shadow Toning: Paints shadows with colors affected by ambient light and reflected light from the ground, multiplies and composites them. For skin or dark objects, further adjust the color of the shadows to make them appear more

natural. The closed shadows in the corners are combined with a darker color.

Change the color of the line art and paint it with a linear burn

## Blending ~ Details



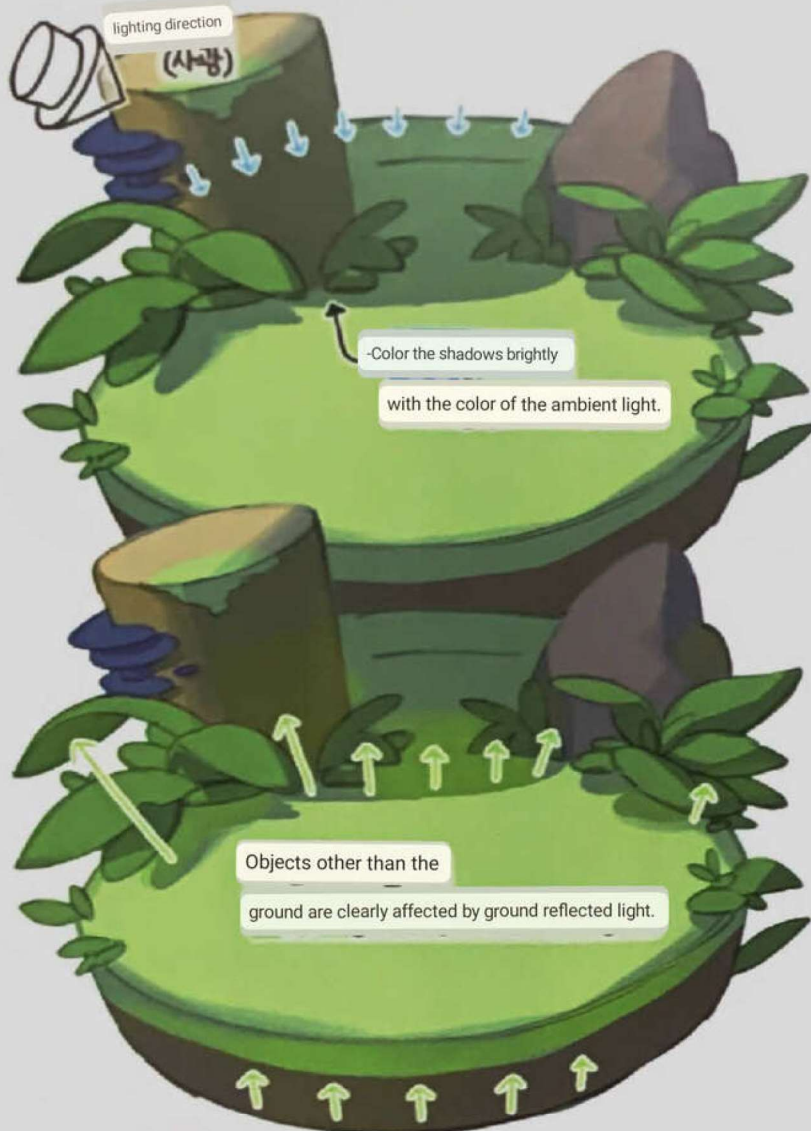
Blending~ Detailed Description: Describe in the same way as the basic character coloring order.

The three-dimensional expression is finished until the material and light

are expressed. With a small, sharp brush, I carefully color details, closed shadows, and outlines.

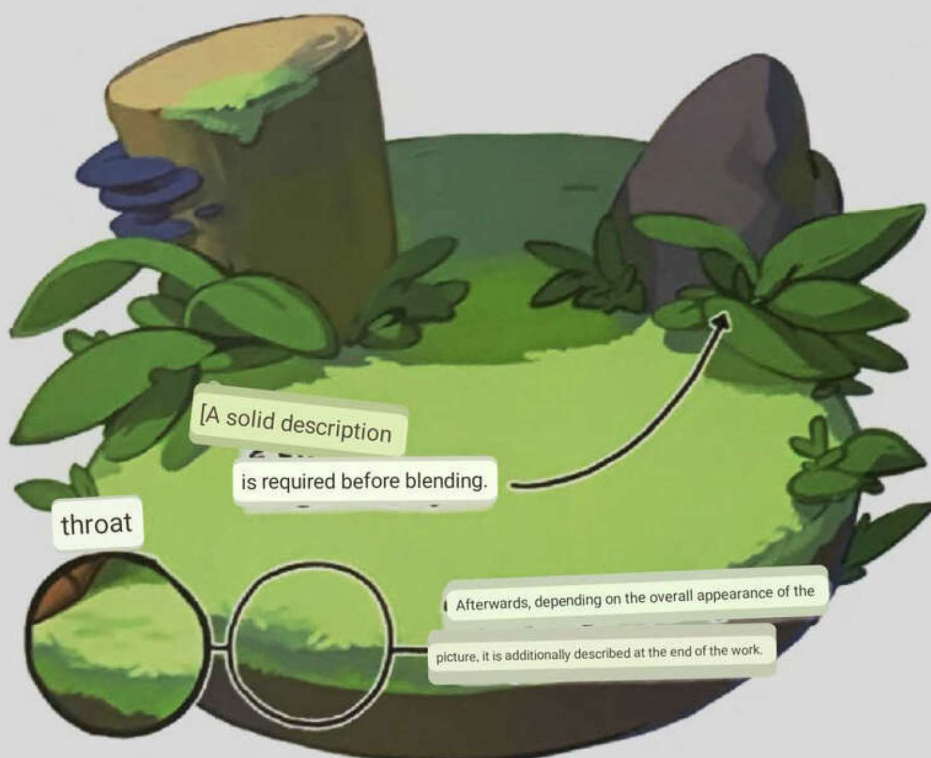


default background color



Color the shadows with lighting in the same direction as the character and multiply and composite. The lower the contrast, the more distant you feel, so adjust the opacity of the layer as needed.

If there is an object other than the ground in the background, consider the color of the reflected light and adjust the color of the shadow by overcoating, etc.



Refine the description as if it were painted with a face so that the outline does not stand out.

The more opaque the brush, the more convenient it is to color with UN area. I omit the too detailed description first, and color in the second half of the work according to the completeness of the character description.



## Material representation







Materials with relatively low reflectivity  
are also 'continued to color the specular.

Materials that are highly  
metallic reflect the colors of  
adjacent objects well.

•The shadow is brightened  
by overcoating the cover letter.

•I paint the dark and dark borders darker.

Let's describe in order  
from wide and weak light  
to small and clear light!

Subsequently, the reflections of the metal and adjacent objects are also additionally colored.

It is recommended that the brush gradually become smaller, depicting in a wide, weak light, small, vivid and in order.

While coloring the indirect light shining on the metallic material, the shadows have become brighter overall, so I add a dark color to the contrasting area. After sufficient indirect depiction, I paint with a material with relatively low reflectivity (leather, skin specular).



t

When highly reflective materials are adjacent to each other, the specular appears reflected multiple times.

Finally, with the lightest color, we paint over the vivid specular that appears on the material.

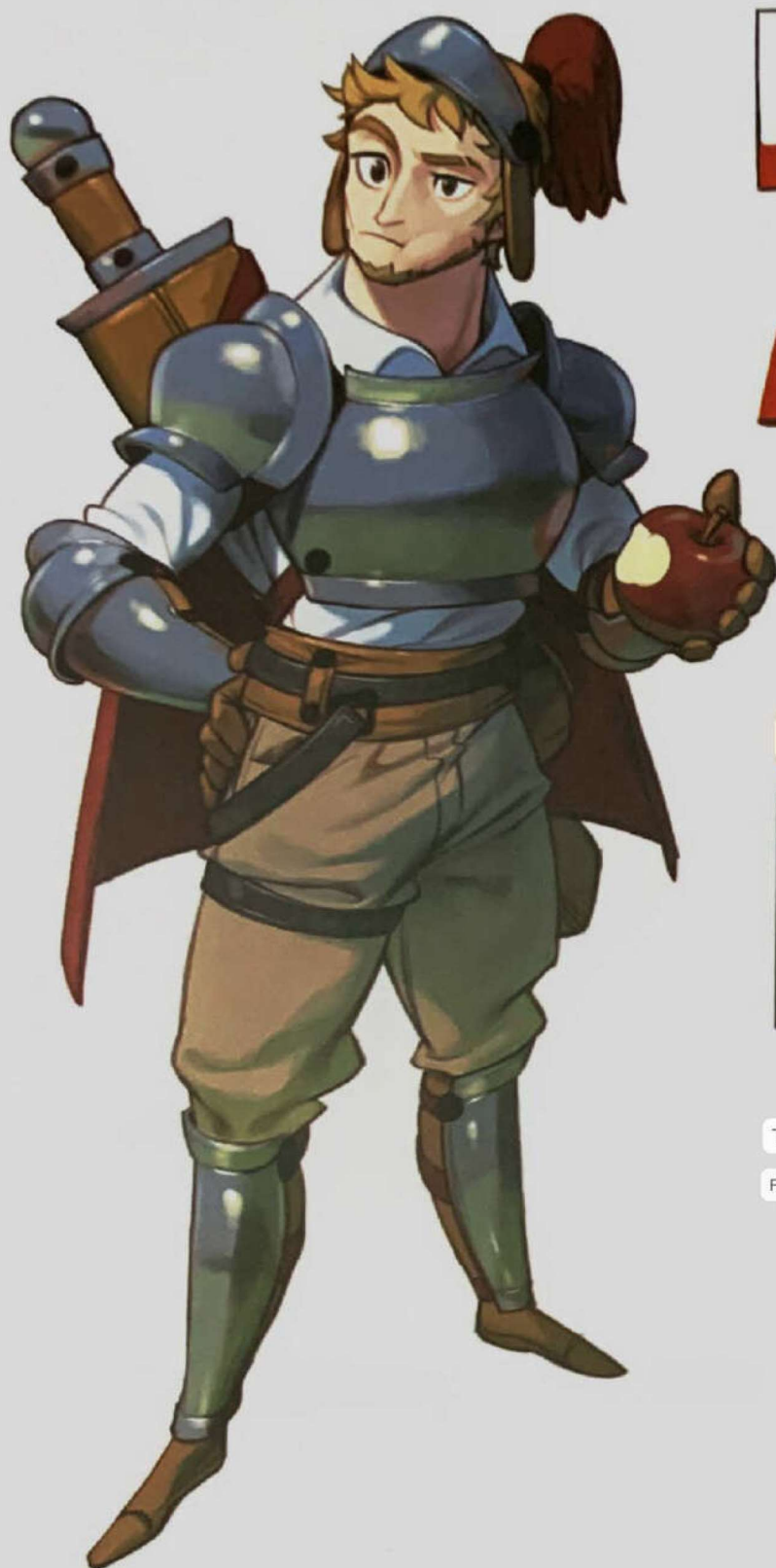
**TIP**

Let's use brush mode!

When drawing a highly reflective material such as metal or a complex lighting situation, you can color by adding light by changing the brush mode to Linear Dodge without blending the colors.





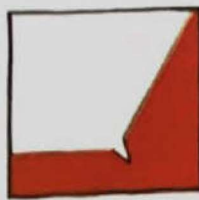


corner expression

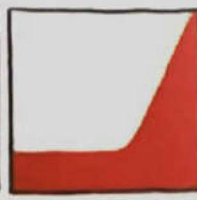
suggestion!



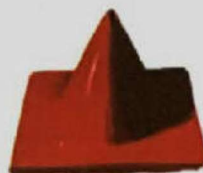
right angle



Bevel



Bevel



To express natural corners,  
add specular color to the corners  
and bevels of the face.

Fresnel effect <Optional!>



No Fresnel effect



Fresnel effect

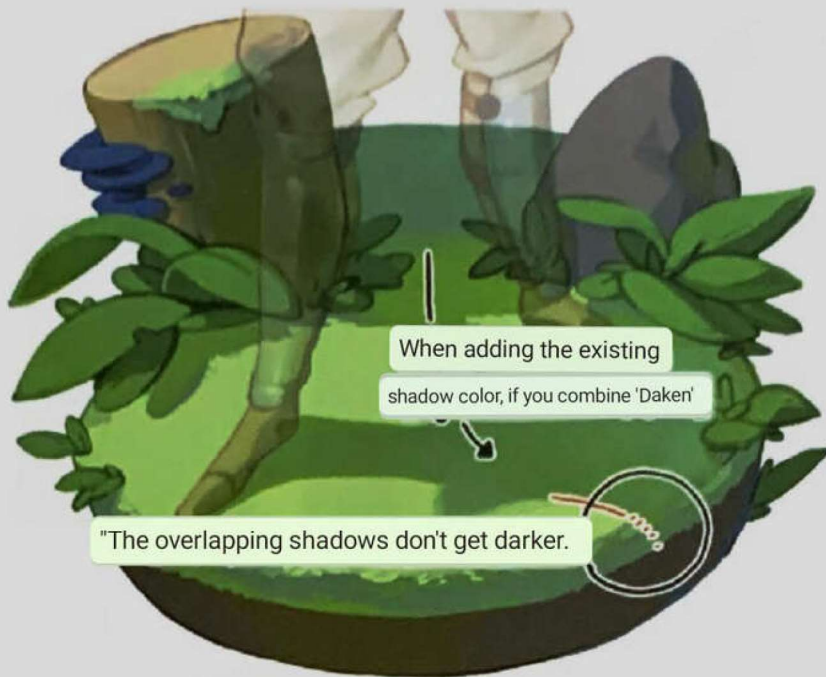
The outer part of the object is more reflective of light due to the  
Fresnel effect, where the more oblique the reflection, the more reflective.

After the big depiction is over,

the small depiction that does not require blending

is done by coloring the background!





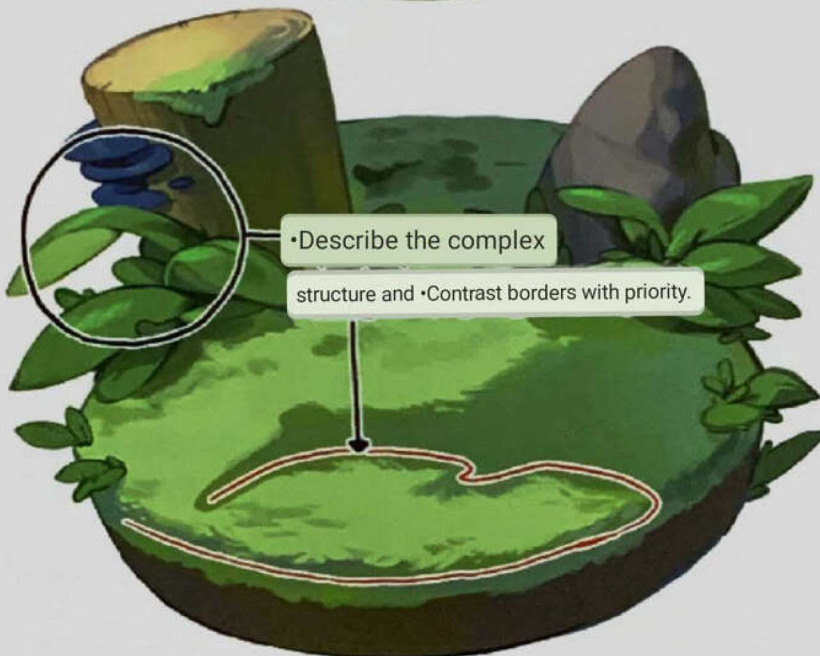
additional background color

Draw them created by the character. By

creating a new layer, recoloring

it, and compositing it with Darken, you can

recolor it without overlapping the existing shadow.

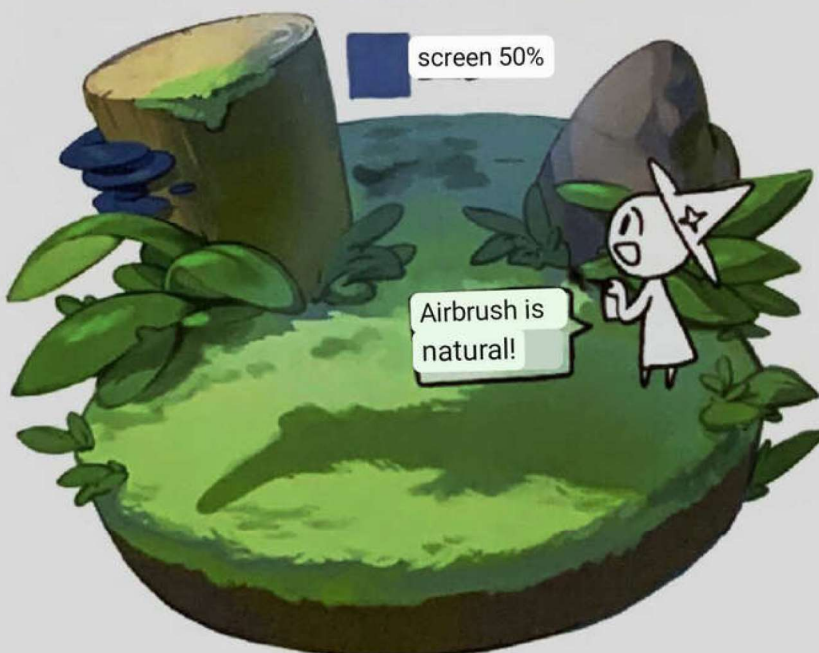


Except for the part that is obscured by the character

Add details from the most visible parts.

It is recommended to simplify

the description compared to the character description.



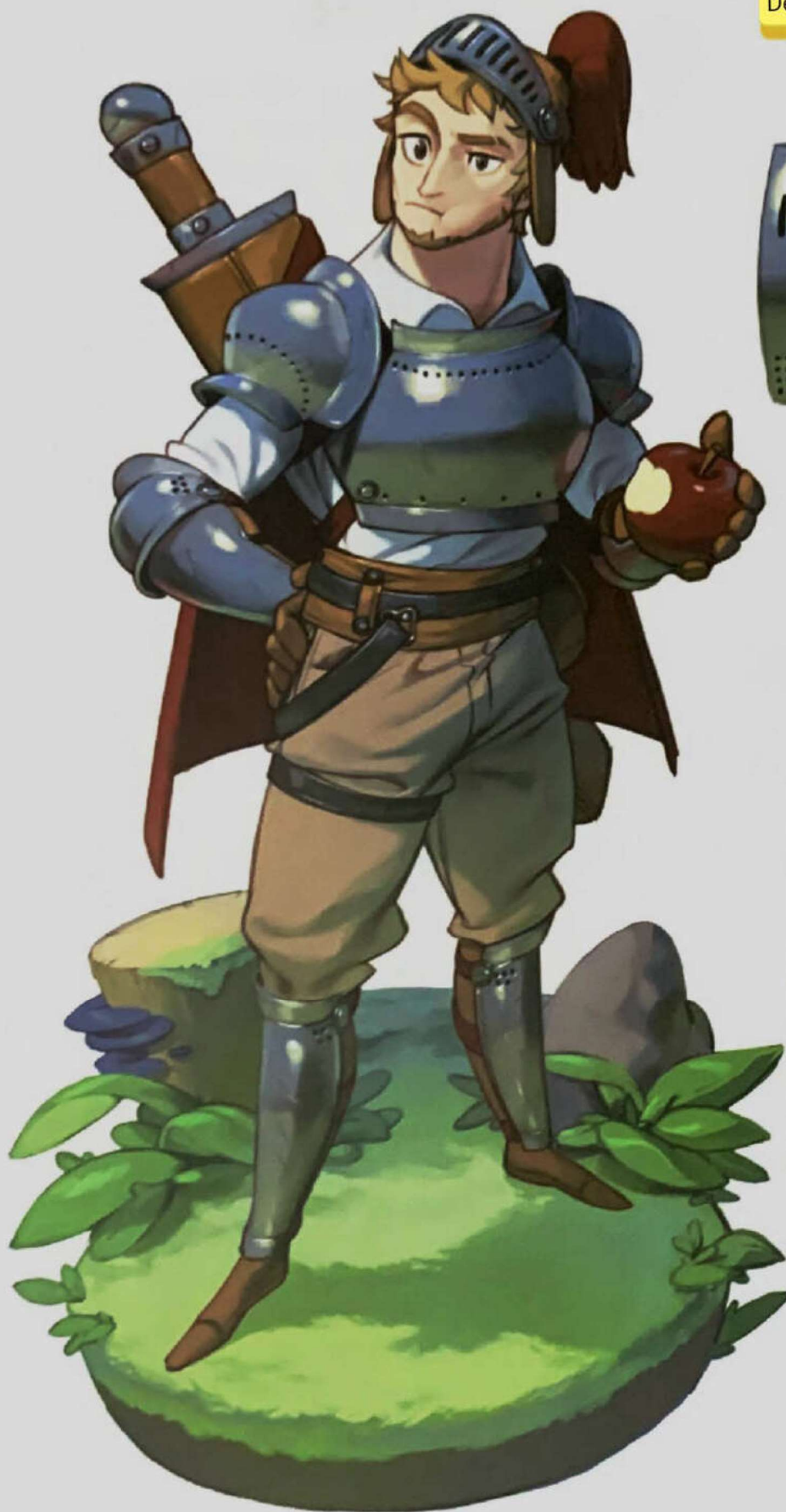
In order to apply the air perspective

to the overlapping part of the character,

the blue color is screen-synthesized

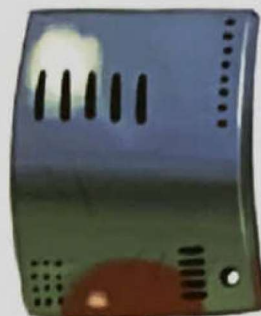
to express a deep sense of space.





## Details - Metal

draw spring.



Specular on the red corner!



Deep grooves or holes in the metal add extra specularity as the cut faces are edged. The specular or specular light around the groove is clearly colored with a small brush.



With black metal trim...



[Paint indirect light as if leaving black]



[With specular]  
[End!!!]

small metal decorations

Since only closed shadows appear,

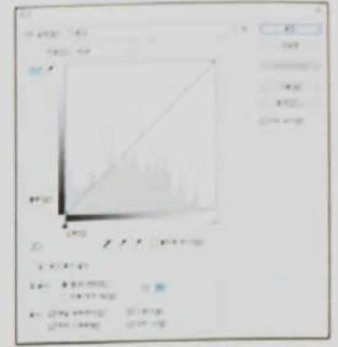
on a black base

the ambient reflected light and ambient light

Finish with a layer of specular.

Completion

color correction + finishing



[The curve ((tH+M)

is most often used,

If you use the  
synthesis method in 62P, it  
will be effective!



daylight.  
Sunny day!



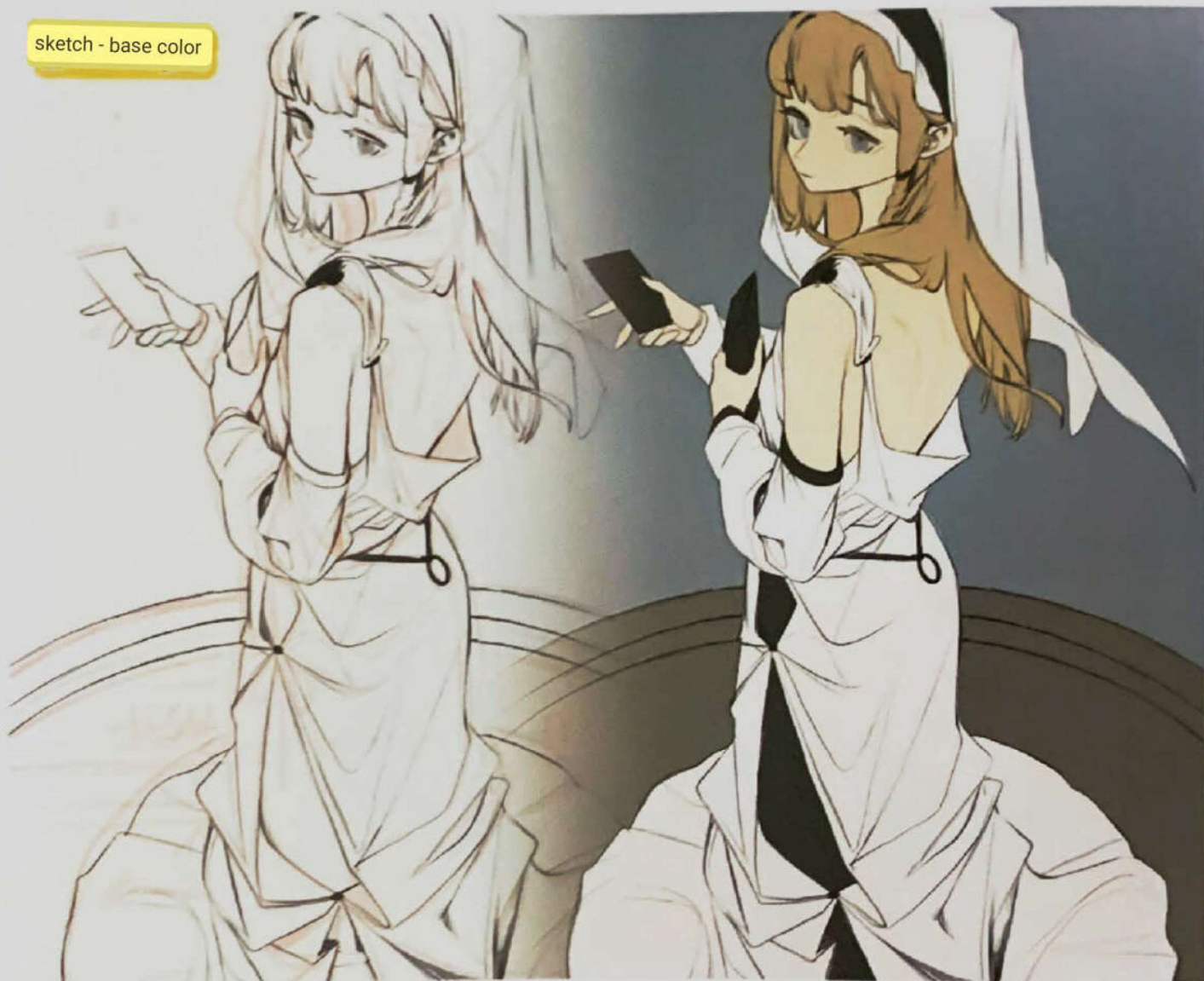
### 3\_illustration coloring

For illustrations including backgrounds, it is important that the characters and the lighting in the background match

harmoniously. The coloring method of the character is the same, but it is good to know the process of completing the illustration as a whole.

It is also necessary to practice sketching the final atmosphere of the illustration at the beginning of the work.

sketch - base color



From the sketch of the character to the process of color matching, I work without much difference from before.



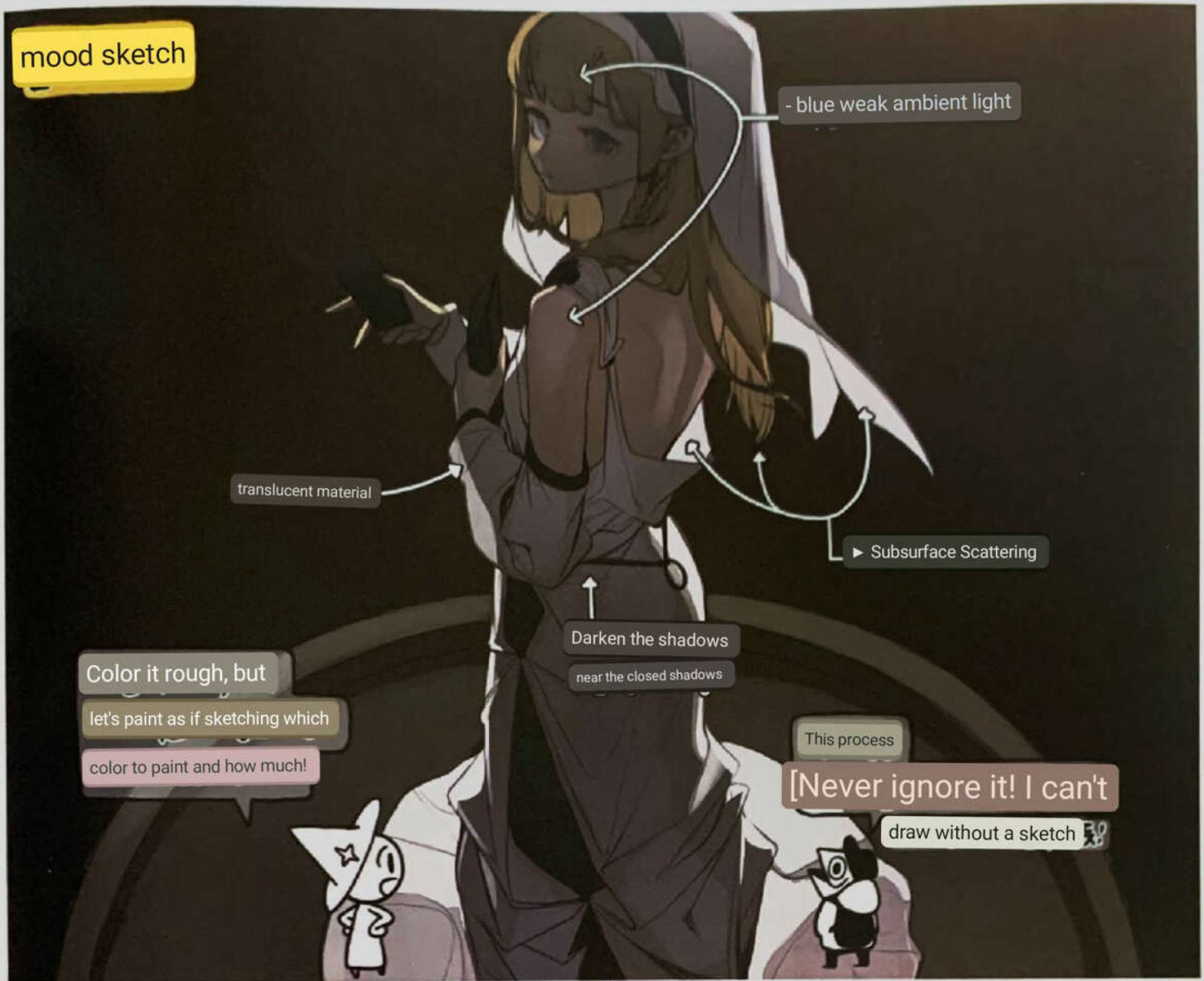
Judging from experience, the sketch of  
the border between light and dark is important,  
and it would be more efficient to complete the small  
decoration later in

the work! .Make the closed shadow darker...

Study your  
own way while  
coloring!



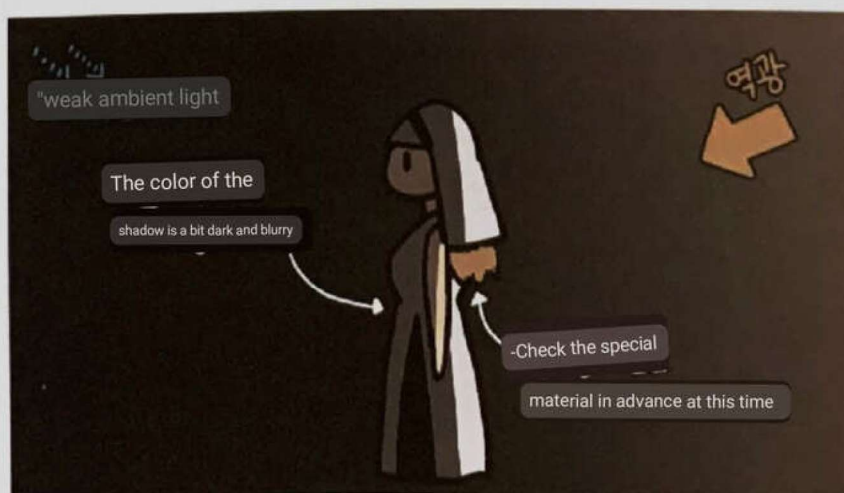
## mood sketch



Atmosphere sketch: I roughly color the atmosphere of the illustration before the full-scale coloring.

Plan what color to use considering the direction and intensity of the light, and the material of the object.

It is recommended to omit the detailed description, but to check the proportion of the area to be colored macroscopically. It is not a process that appears in the illustration to be completed, but do not neglect it.







Blending: While referring to the atmosphere sketch, I start with the shadows created by the main name.

## TIP

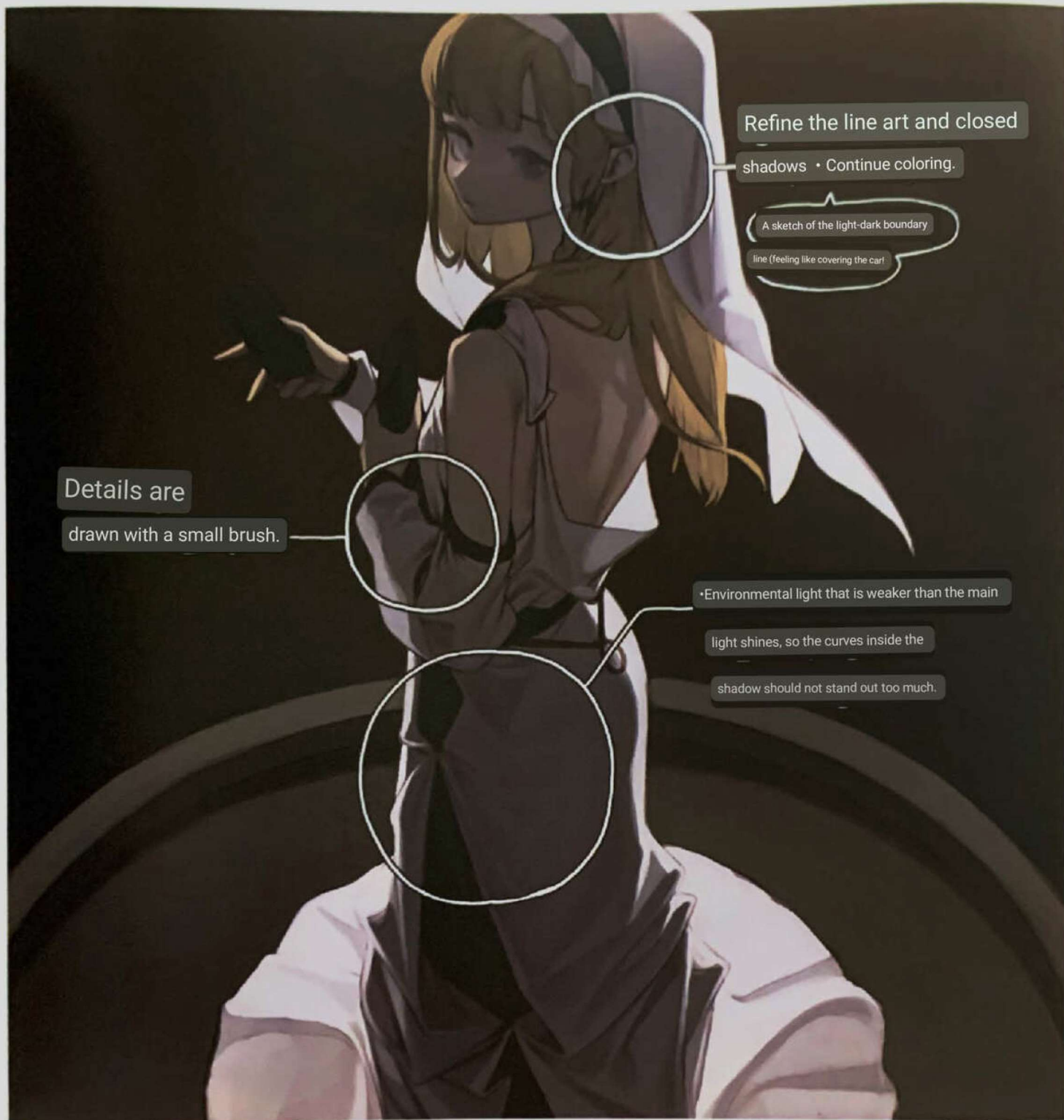
Efficient illustration description order

close to far

big thing small

simple things complicated

It is good to prioritize the description while considering the size of the brush and the coloring method.



The curves and closed shadows inside the shadow are also colored in succession.

If the small descriptions expressed at this time stand out too much, the sense of unity will decrease, so

I paint carefully. It's good to aim for even subtle color differences.



### Closed Shadow + Reflected Light

A little bit of the reflected  
light reflected from the highlights.

-A dark closed shadow is created in the corners  
because the light does not shine well.

Detailed closed shadows

are directly colored with a small brush...

-If you want to paint a wide closed  
shadow, repaint it with a large transparent  
brush or use the Burn and Burn tools.



Closed Shadow + Reflected Light: The closed shadow of the corner and the reflected light from the highlight are overlaid on the shadow area to

refine the color of the shadow and emphasize the three-dimensional effect.

## ambient light

In a smooth texture with high reflectivity.

Ambient light is good.

•Apply very lightly with  
the texture of diffuse reflection.

The shadows are getting more concrete

and the perfection is getting higher!!

In complex structures such as clothes folds,

the most protruding corners are

painted with a bright color.

blending

강조

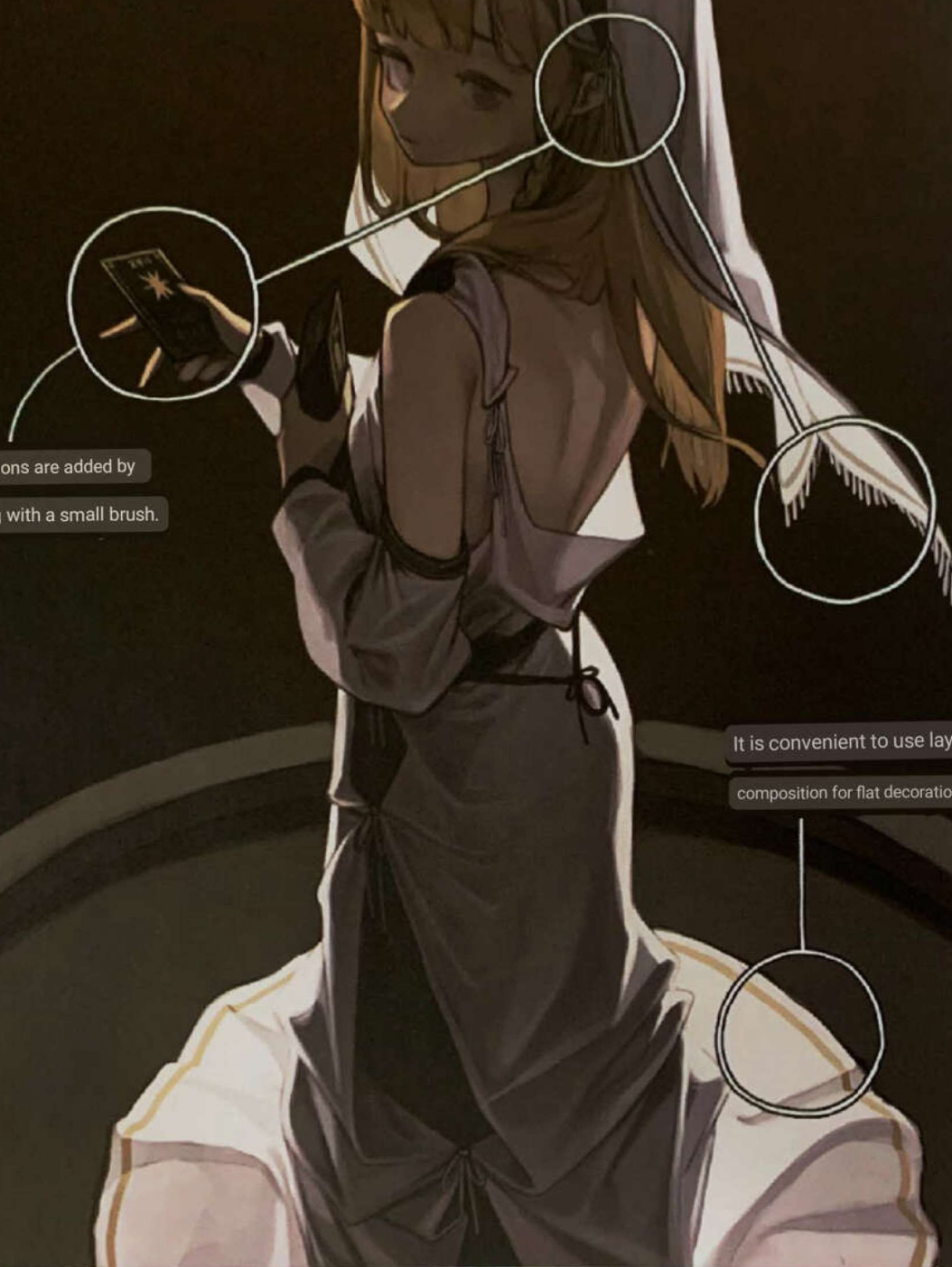
ambient light : Color the ambient light inside the shadow while referring to the atmosphere sketch.

It is good to express the difference in light reflection depending

on the material. Next, I add another indirect light to the picture to complete it.



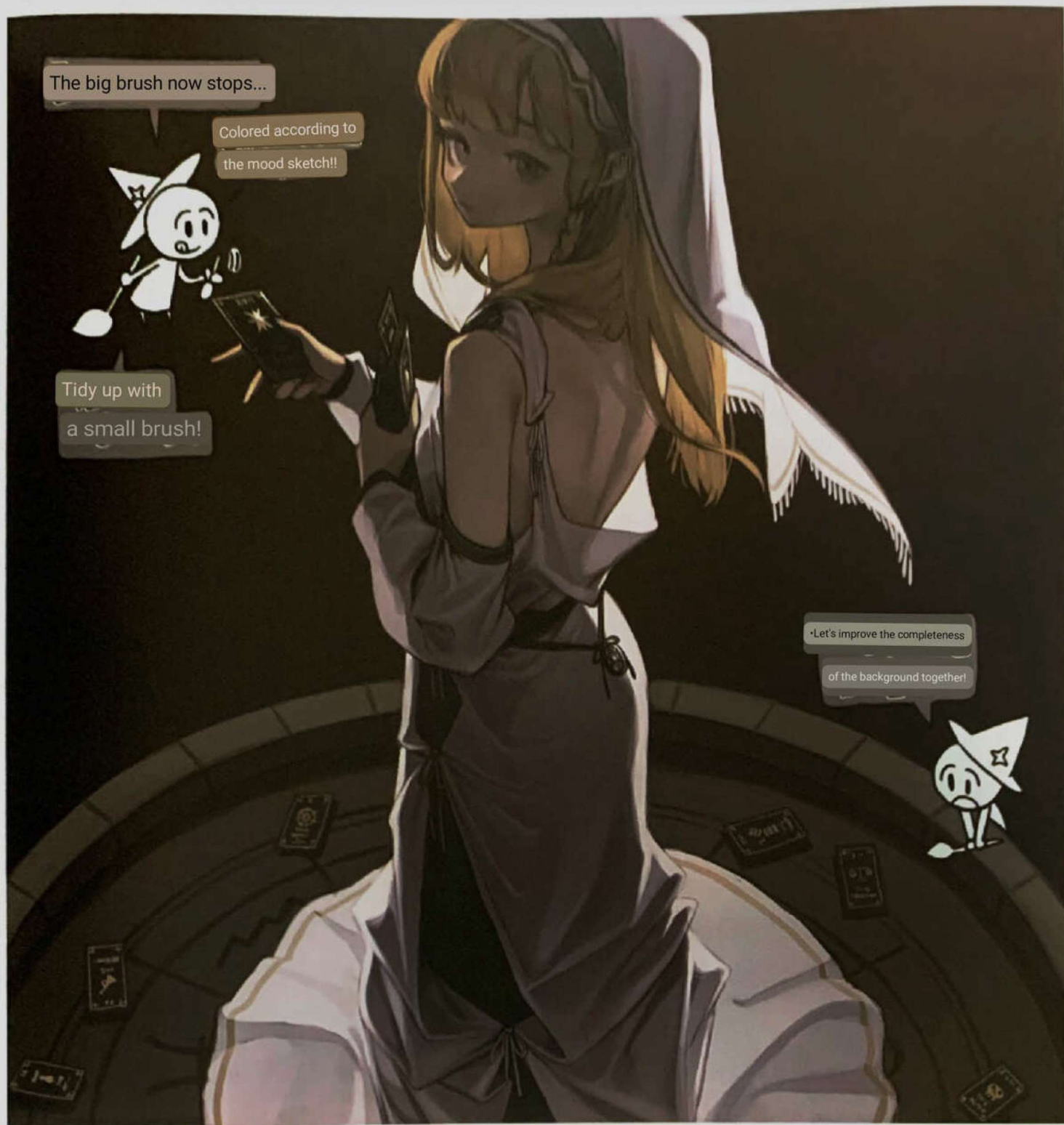
## detail



Small decorations are added by  
hand-painting with a small brush.

It is convenient to use layer  
composition for flat decorations such as patterns.

Detail: Adds small decorations, patterns, etc. that do not require blending. You  
can use a small and clear brush, and use the layer compositing function.



The big brush now stops...

Colored according to  
the mood sketch!!

Tidy up with  
a small brush!

•Let's improve the completeness

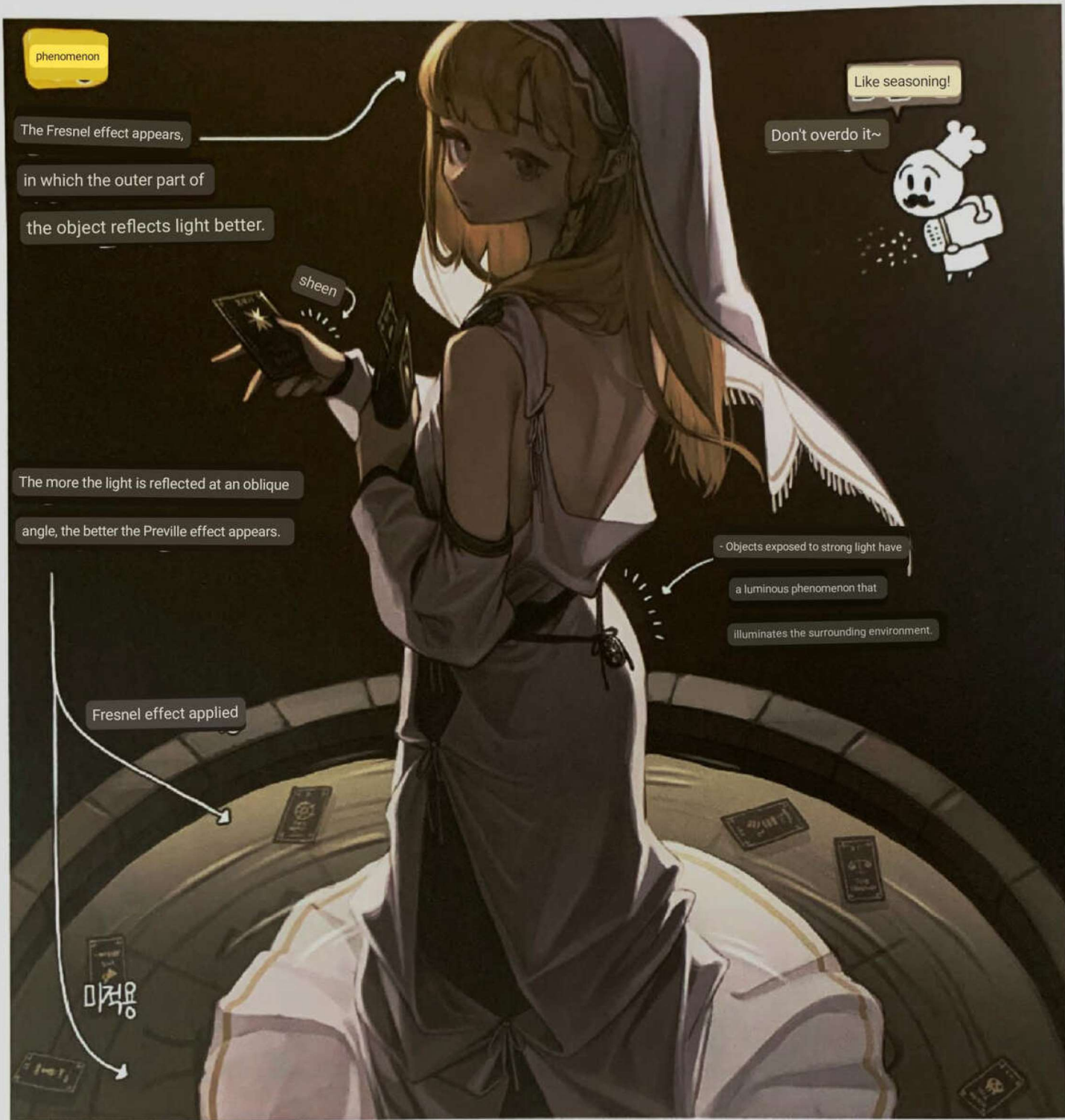
of the background together!

As we refine the existing depictions and additional decorations, we color the background as well.

Describing the setting balances the character's completeness and balance.

It's a good idea to check from time to time to see if things went as planned in the mood sketch.

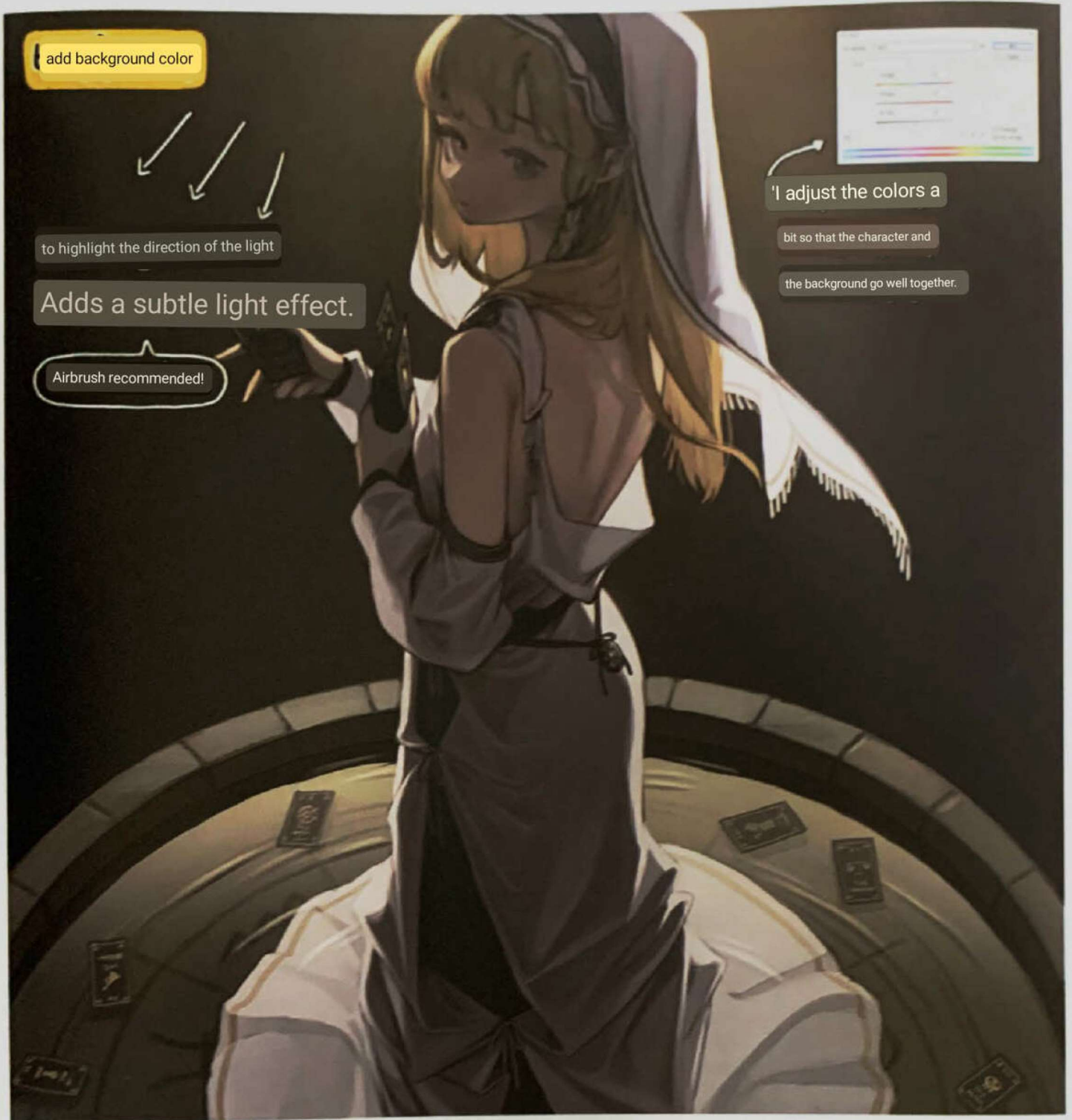




Phenomenon: Adds a phenomenon that appears due to the interaction of light and material.

Excessive description of the phenomenon may mask the descriptions expressed with direct color, so be careful.

Even if a specific phenomenon does not appear, we sometimes add a suitable optical phenomenon for the atmosphere of the illustration.



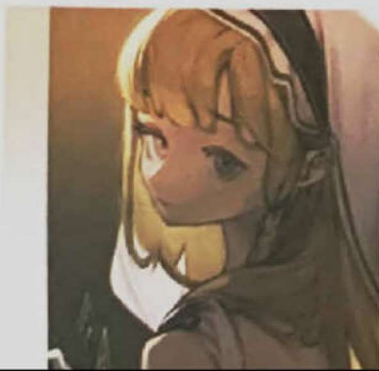
Additional background coloring: The background is additionally described so that the background and the character match each other.

Rather than depicting additional objects in the background, it is better to express the lighting direction or perspective.





Correction and completion: Check the atmosphere of the illustration and correct the color and finish.

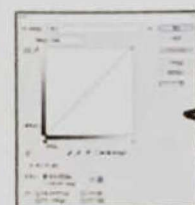
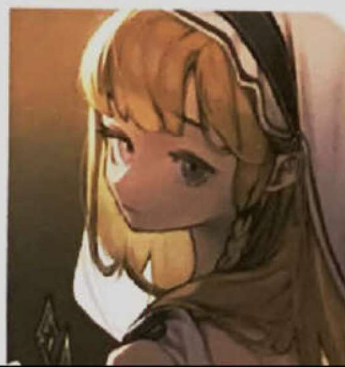


[Adjust the color with

overlay synthesis and...

Use the V

airbrush!



Curve  
1 (GH+M)

Adjust the brightness with curves!

